

HELMINTHOLOGICAL ABSTRACTS

incorporating

BIBLIOGRAPHY OF HELMINTHOLOGY

COMPILED FROM WORLD LITERATURE OF 1955



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(HELMINTHOLOGY)**

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SYSTEMATICS AND RELATED

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178—Acta Zoologica Mexicana.

- a. CABALLERO Y C., E., 1955.—“Estudios helmintológicos de la región oncocercosa de México y de la República de Guatemala. Nematoda. 9a. parte.” 1 (2), 5 pp. [English summary p. 4.]

(178a) Caballero describes *Lauroia intermedia* n.sp. collected from the armadillo *Dasyus novemcinctus fenestratus* in 1945 in Santa Rosa, Guatemala. The presence of submedian papillae on the lips, a ventral spine behind the cephalic plates and a pair of anal papillae far in front of the anus are the features distinguishing *L. intermedia* from *L. trinidadensis*. Should these structures be found on *L. trinidadensis* the new species will become synonymous with it. M.MCK.

179—Agricultural Gazette of New South Wales.

- a. ANON., 1955.—“Liver fluke of sheep and cattle and black disease of sheep.” 66 (8), 426-431; (9), 463-470.

(179a) The problem of *Fasciola hepatica* in sheep and cattle in Australia and the indications and treatment of fluke disease are discussed. Kangaroos and rabbits are wild hosts. The vector in New South Wales is *Simulium subaquaticum*. Although doses of 5 c.c. or of 20-25 c.c. of a 1:4 carbon tetrachloride and liquid paraffin mixture (given for treatment of adult flukes and young flukes respectively) are relatively safe for grown cattle, they should not be given to cattle which are deficient in calcium. Pregnant cows or cows in milk should be given quantities of bone meal or other substitute for several weeks before treatment. Factors predisposing to high mortality in sheep from carbon tetrachloride treatment include extensive feeding on concentrates, sorrel in the grazing, and driving sheep long distances before or after drenching; subcutaneous injections of 30-50 c.c. of a 20% solution of calcium borogluconate alleviate poisoning in cases of hypocalcaemia. If sheep are found dead in natural positions in districts subject to fluke and their carcasses putrify quickly, black disease is indicated. Black disease and preventive measures against fluke are fully discussed. M.MCK.

180—American Journal of Clinical Pathology.

- a. TOMPKINS, V. N. & MURASCHI, T. F., 1955.—“Complement-fixation test for trichinosis.” 25 (2), 206-213.

(180a) Earlier detection and higher sensitivity can be obtained by examining the serum of patients with trichinosis undiluted and in 1:5 saline dilution with three 50% units of complement and a minimum of three dilutions of antigen. Complement fixation reactions which are highly specific indicate relatively recent infection especially with a rising titre. The reaction is apparently not induced by skin tests and persists for six to 18 months only after infection. R.T.L.

181—American Journal of Gastroenterology.

- a. VIRANUVATTI, V., KSHEMSANT, D. & BHAMARAPRAVATI, N., 1955.—"Retention cyst of liver caused by opisthorchiasis associated with carcinoma. Case report." **23** (5), 442-446.

182—American Journal of Tropical Medicine and Hygiene.

- a. McMULLEN, D. B., 1955.—"Introduction to the schistosomiasis symposium." **4** (3), 381-382.
- b. KUNTZ, R. E., 1955.—"Biology of the schistosome complexes." **4** (3), 383-413.
- c. LARUE, G. R., 1955.—"Discussion of the paper by Robert E. Kuntz." [Symposium on schistosomiasis.] **4** (3), 414.
- d. OLIVIER, L., 1955.—"The natural history and control of the snails that transmit the schistosomes of man." **4** (3), 415-423.
- e. VAN DER SCHALIE, H., 1955.—"Discussion of the paper by L. J. Olivier." [Symposium on schistosomiasis.] **4** (3), 424-425.
- f. RITCHIE, L. S., 1955.—"The biology and control of the amphibious snails that serve as intermediate hosts for *Schistosoma japonicum*." **4** (3), 426-441.
- g. HSÜ, H. F., 1955.—"Discussion of the paper by Lawrence S. Ritchie." [Symposium on schistosomiasis.] **4** (3), 442.
- h. OLIVER-GONZÁLEZ, J., BAUMAN, P. M. & BENENSON, A. S., 1955.—"Immunological aspects of infections with *Schistosoma mansoni*." **4** (3), 443-452.
- i. BANG, F. B., 1955.—"Discussion of Dr. Oliver-González' paper." [Symposium on schistosomiasis.] **4** (3), 453-454.
- j. MOST, H., 1955.—"Treatment of schistosomiasis." **4** (3), 455-459.
- k. ANDERSON, H. H., 1955.—"Discussion of Dr. Harry Most's report on therapy of schistosomiasis." [Symposium on schistosomiasis.] **4** (3), 460.
- l. PALMER, E. D., 1955.—"Course of egg output over a 15 year period in a case of experimentally induced necatoriasis americanus, in the absence of hyperinfection." **4** (4), 756-757.

(182a) Introducing a symposium on schistosomiasis, McMullen pointed out that to reach the same degree of proficiency in the control of schistosomiasis as in yellow fever, typhus and malaria, the combined efforts of experts in the fields of agriculture, biology, chemistry, oecology, education, engineering, epidemiology, malacology, medicine and public health may be required to solve this problem. After deploring the inadequacy of the therapeutic drugs and molluscicides, McMullen quoted the case of a compound tested in his own laboratory. At a concentration of 0.007 p.p.m. it was lethal to fish, but mice were said to tolerate 250 mg. per kg. body-weight. The compound was unfortunately only mildly toxic to snails and when tested as a therapeutic drug the worms were unaffected. However, the mere existence of such a compound was encouraging and there were indications that further studies on molluscicides would be rewarding. There was also evidence of a concentrated effort on the study of the bionomics and oecology of the snail vectors. In this symposium the panel will discuss what appear at present to be some of the most active phases of research on schistosomiasis, the approach being primarily directed towards the control of the disease.

D.L.H.R.

(182b) Reviewing the biology of the schistosomes from the standpoint of parasite-definitive host and parasite-intermediate host complexes in different geographical regions, Kuntz considers that a study of the schistosomes of greater concern to man and animals on a geographical basis falls into the following regional categories: Africa and the Middle East, Portugal, India, the Orient including China, Japan, the Philippines and Formosa, and the Americas. In Africa and the Middle East the principal schistosomes of man and lower mammals fall into two general categories, those of the *Schistosoma haematobium* type with terminally spined eggs and those of the *S. mansoni* type producing laterally spined eggs. Representatives of the *haematobium* complex (namely, *S. bovis*, *S. intercalatum*, *S. matthei* and probably others which occur in livestock) are of greater concern in human schistosomiasis than those of the *mansoni* complex. In Portugal schistosomiasis haematobia is unique since the causative agent is morphologically similar to *S. haematobium* in Africa but is restricted in its distribution and is transmitted by *Planorbis dufourii*. In India schistosomiasis is primarily a disease of livestock, although the recent discovery of an endemic focus of urinary schistosomiasis in the Bombay State may present a serious problem. In the Orient

where *S. japonicum* is transmitted by several species of *Oncomelania* and infects man and a wide range of mammalian hosts, the existence of geographical and physiological strains of the parasite and its intermediate host have recently been demonstrated. In Formosa, however, the schistosome has been designated a "non-human strain" since it is essentially a parasite of lower mammals. In the Americas geographical and physiological strains of *S. mansoni* and its intermediate host have been adequately demonstrated. In this region, schistosome dermatitis has received considerable recognition.

D.L.H.R.

(182c) LaRue stresses the importance of accurate identification of schistosome species and of the intermediate hosts and points out that research workers should indicate their methods of study as different techniques may give different results. He suggests that hybridization studies between the various races of *Schistosoma mansoni*, *S. haematobium* and *S. japonicum* should be carried out and the infectivity of the offspring to geographical races of intermediate and definitive hosts investigated.

S.W.

(182d) Olivier presents details of some of the investigations made by the National Institutes of Health, the Pan American Sanitary Bureau and the Brazilian Ministry of Health in north-eastern Brazil in conjunction with field tests of promising molluscicides being made there. A study of the manner in which *Australorbis glabratus* and species of *Tropicorbis* survived the dry season revealed that there were usually many snails present just before the water dried up; soon afterwards snails could be found in unexposed locations at the soil surface but not deep in the mud. The mortality rate during the dry season was high and the few survivors were principally in shaded places. In the laboratory it was found that these snails do not conserve their moisture at low relative humidities and that a high relative humidity was essential to survival out of water. It was concluded that the best time to apply a molluscicide may be at the start of the rainy season but that since the aestivating snails are at the soil surface during the dry season, clearing and burning the vegetation might reduce materially the snail population during this period. A study of the size of snails from one pool revealed that about five weeks after the onset of the rainy season a large percentage of the snails were small, representing a new generation. As the wet season progressed these snails grew to adult size but few new snails appeared in the colony later in the wet season. When the pool dried neither very large nor very small snails were present and most of the snails surviving the dry season were approximately 15 mm. in diameter. There was no evidence that any snails survived two wet seasons. In the habitats that never dry it was observed on several occasions that a snail population became greatly depleted or even disappeared without apparent cause. A study of the reproductive potential of snails which survived the dry season revealed that in about five weeks the surviving snails had laid eggs and repopulated the pool. In a discussion on the control of aquatic schistosome vectors, Olivier expresses the opinion that the method which best satisfies the criteria of speed, effectiveness and reasonable economy is the use of molluscicidal chemicals. He points out that there is real reason to believe that sodium pentachlorophenate will be effective in running water but the solution to the difficult problem of molluscicidal treatment of a snail habitat containing snails living outside the water is not yet at hand.

D.L.H.R.

(182e) Van der Schalie, as a malacologist, considers that there is urgent need for developing medical malacology. At present some of the best studies on molluscan vectors are those of parasitologists. In Brazil, snails harbouring schistosome larvae are unable to survive periods of hibernation. In Egypt after the winter closure of canals, there were no snails shedding cercariae until about the middle of May. The surviving snails only shed cercariae after becoming newly infected. Mechanised clearance of mud and sediment from the canals in Egypt might be worth while.

R.T.L.

(182f) After a general review of the existing literature on the biology and control of the amphibious snails that serve as intermediate hosts of *Schistosoma japonicum*, Ritchie

incorporates an account of the nature and results of several organizations investigating the morphology, bionomics, reproduction and control of *Oncomelania*. Morphological studies have revealed that the infection is localized in the gonads rather than the liver, displacing gonadal tissues and warranting the inference that at least temporary sterility results. Investigators are agreed on the importance to the snail of dense vegetation and water. As regards food it has been found that the snails will survive longer on filter paper alone than on either of nine other substances including fish foods, leaves, soil, liver extract, weathered wood and celotex. It appears that decaying matter, high in cellulose content and poor in protein, and living unicellular soil organisms constitute the primary foods. The snails are neither decidedly aquatic nor terrestrial but uninterrupted wetness must prevail during the period of propagation. Recent studies have shown that the snails respond positively to strong light and negatively to weak light; the snails are negatively geotropic but at angles of inclination of 5° and 7° the response to gravity could be nullified by a positive response to light. That egg-laying in *Oncomelania nosophora* usually occurs on soil while *O. quadrasi* shows a preference for brick has been recently confirmed. Incubation may extend from 10 to 35 days and the snails may live as long as five years, the rate of growth varying according to the species and the temperature of the environment. Agriculture and related engineering practices, biological controls and the use of toxic agents in the control of *Oncomelania* are discussed. D.L.H.R.

(182g) Although in Japan, China and Formosa schistosomiasis japonica is a major medical problem, the known vectors are restricted to small isolated habitats. As the physical and chemical properties of the water and soil, and the light, humidity and vegetation in uninhabited ditches are often similar to or identical with those supporting thriving colonies in the vicinity, a knowledge of the factors influencing the distribution of the vectors would be of value in molluscan control. R.T.L.

(182h) Oliver-González, Bauman & Benenson present details of antibody experiments on sera from patients with *Schistosoma mansoni* infections, using as antigens extracts of adult worms, cercarial extracts, living cercariae and living eggs. In short term infections high titres were obtained for cercarial precipitins and agglutinins in all cases, but in infections of long duration titres were low and were obtained with only 18.8% and 6.1% respectively of the patients. On the other hand, the sera from patients with old infections contained a larger concentration of circumoval precipitins, 49.5% to 72.8% as compared with 29.4% to 53.2% of the eggs showing a precipitate. After foudadin therapy the circumoval precipitin content of sera diminished and a smaller percentage of eggs was affected. Stage specificity of antibodies was demonstrated by the observation that the precipitins produced in rabbits injected with powdered adults, cercariae or eggs of *S. mansoni* gave higher titres when tested against the homologous than when tested against the heterologous antigens. Cercarial agglutinin titres were also higher in the sera from rabbits immunized with cercariae but low titres were observed in the sera from rabbits immunized with adults and eggs. When the circumoval test was used on these sera, the anti-adult sera caused no reaction about the schistosome eggs, and the anti-cercarial gave only a slight reaction while the anti-egg sera exhibited marked circumoval precipitation. Treatment of each antiserum with the homologous parasitic stage material always resulted in the absorption of the homologous antibody. In only one instance was there complete absorption of antibodies against one stage by another, cercarial antibodies being completely absorbed by powdered or living eggs. The sera from all mice with mono-sexual infections were negative when tested for circumoval precipitins. They were positive for cercarial agglutinins. Of 54 individuals who had not received foudadin therapy, only three gave positive reactions when the egg antigen was used in the intradermal test. In treated cases the number of patients giving positive reactions with this test increased with the interval since treatment. D.L.H.R.

(182i) Bang summarizes the immunological aspects of the diagnosis of schistosomiasis with which most workers are in agreement. These are: (i) that there is an early increase

and good titre of antibodies to living cercariae and miracidia in the sera of infected animals, (ii) that there is a lack of specificity in these reactions although not apparently in the reactions to the eggs and (iii) that there is a cross reaction with sera from man and animals infected with *Trichinella*. He then points out that we do not yet know the relationship of the development of these reactions to resistance nor how most of the antibodies operate. S.W.

(182j) Most reviews the existing drugs used in the treatment of schistosomiasis. In his opinion tartar emetic is the most efficient drug in the treatment of the three human schistosome infections, its principal disadvantages being that it requires care and experience in administration, is moderately toxic and must be administered intravenously during a relatively long course requiring numerous injections. Despite these objections it is the drug of choice in infections caused by *Schistosoma japonicum*. Tartar emetic is obviously superior to stibophen for with a total dosage of stibophen of 100 c.c. (6.3% solution) on a schedule of 5 c.c. every other day cures reach only 40%, whereas if the same amount of antimony is given as tartar emetic at least 90% cures are observed. The so-called intensive schedules, while improving the therapeutic results, have been found too toxic and impractical for mass control measures, but if the recent experience of Friedheim *et al.* [for abstract see Helm. Abs., 23, No. 68f] with a new compound TWSb (antimony-a, a'-dimercapto-potassium succinate) which has low toxicity and a high order of definitive cures, is confirmed, it may resolve the shortcomings of the intensive schedules in so far as schistosomiasis *mansoni* and probably schistosomiasis haematobia are concerned. Other trivalent and pentavalent compounds (ethylstibamine, stibamine glucoside, urea stibamine, anthiomaline and stibanose) have been found moderately effective in *S. mansoni* infections and ineffective in *S. japonicum*, and it is questionable whether any offer advantages over stibophen. With xanthone and thioxanthone derivatives there have been major differences in therapeutic results and toxic experiences and, in the light of recent studies, these appear to be related to the preparations or derivatives of miracil studied, the total dose and schedules of administration, differences in severity of infection and exposure to reinfection in various geographical areas and, most important, differences in criteria of cure. Most concludes that tartar emetic administered intravenously in total doses of 2.5 gm. should cure at least 95% of patients with *S. japonicum* infections. In the treatment of individual cases of *S. haematobium* and *S. mansoni* infections, 5 c.c. of stibophen intramuscularly daily are recommended with total doses of 75 c.c. and 100 c.c. respectively, from the standpoint of definitive cures approaching 100%. For alleviation of symptoms or mass control schedules for large population groups, the miracil derivatives are recommended with the reservation that the actual cures will be low. D.L.H.R.

(182k) Anderson reports a personal communication from Dr. H. G. Johnstone that four deaths occurred recently in San Francisco in personnel returned from overseas. He thinks it advisable, in using tartar emetic, to begin with very small doses and after some tolerance has been established to raise the dosage much higher. When rats or mice are given a dose equivalent to one third of the lethal amount of an antimonial they can be given a fatal dose within five to 48 hours without harm. Liver biopsy might be used more frequently to assess the results of treatment. R.T.L.

(182l) Following experimental infection of a healthy 21-year-old white male with *Necator americanus*, faecal egg counts were made at frequent intervals for a year and thereafter at intervals of approximately six months until egg output ceased after 15 years. The number of eggs per gramme of faeces increased from 55 during the first three days of patency to 3,531 after five months. Tetrachlorethylene and then carbon tetrachloride were administered but only one male and two female worms were passed and the egg counts continued unaltered. The peak of over 8,000 e.p.g. was reached during the second and third years; the count remained above 5,000 for the next four years and then gradually decreased. No reinfection is believed to have occurred. M.MCK.

183—American Journal of Veterinary Research.

- a. COLGLAZIER, M. L. & TURNER, J. H., 1955.—“An experiment on the cumulative efficacy of phenothiazine-salt mixture against *Nematodirus* and *Haemonchus* in lambs during a second grazing season.” 16 (61), 558–562.
- b. BLACKWELL, R. L. & ALLEN, R. W., 1955.—“Effect of phenothiazine on conception rate in sheep.” 16 (61), 563–564.
- c. BROWN, H. W. & CHAN, K. F., 1955.—“The effect of piperazine-HCl on migrating larvae of *Ascaris suum* Goeze 1782.” 16 (61), 613–615.

(183a) The authors previously reported that a 1:9 phenothiazine-salt mixture, administered by free choice, gave a considerable measure of control of mixed infections of *Nematodirus spathiger* and *Haemonchus contortus* in lambs [for abstract see Helm. Abs., 23, No. 350b]. They now show that there is a cumulative advantage when lambs are kept on the same pasture over a second grazing season and that the continued use of the phenothiazine-salt mixture is advantageous. The treated lambs showed lower egg counts, fewer total worms, greater weight gains and higher blood levels, and were in better condition than control lambs. The lambs also benefited more from the medication than did comparable lambs of the previous season, indicating that the regimen achieves progressive decontamination of pastures in successive seasons. D.M.

(183b) This is a report on an experiment to determine the effect, if any, of full therapeutic doses of phenothiazine administered to ewes one day before the start of the breeding season. 96 ewes were used of which 48 were treated with phenothiazine and the remainder used as controls. No detrimental effects on the occurrence of oestrus, conception to first service, total pregnancy during the breeding season, or frequency of twinning were observed in the treated group of ewes. D.M.

(183c) Although heavy infections with adult *Ascaris lumbricoides* interfere with the growth of young pigs, the larval migrations through the lungs may also cause varying amounts of damage through haemorrhage and pneumonia. Mice were dosed with piperazine hydrochloride to test its effect on this larval migration. When administered orally before and after feeding them infective *Ascaris* eggs, it prevented the hatching larvae from invading the blood stream and the lungs. When the drug was fed after the larvae had invaded the blood stream, it did not prevent them from reaching the lungs and causing severe pneumonia. Intraperitoneal injections of the drug had a slight effect on the migrating larvae. The drug did not appear to be excreted in the milk of a lactating mouse in sufficient quantity to affect newly hatched larvae in the intestines of the sucking mice. D.M.

184—American Midland Naturalist.

- a. JASKOSKI, B. J., 1955.—“A parasitological study on Navy recruits.” 53 (2), 442–445.
- b. DORAN, D. J., 1955.—“A catalogue of the protozoa and helminths of North American rodents. IV. Trematoda.” 53 (2), 446–454.
- c. MONACO, L. H. & MIZELLE, J. D., 1955.—“Studies on monogenetic trematodes. XVII. The genus *Dactylogyrus*.” 53 (2), 455–477.

(184a) In a survey of the intestinal parasites in 1,009 American Navy recruits in 1952, helminths were found only in those from south-eastern areas of the U.S.A. *Necator* was present in eight, *Ascaris* in three, *Strongyloides* in three, *Trichuris* in two and *Hymenolepis* in one. The incidence of parasites in the group was lower than in the general population, possibly because a particular age group was involved (90% being between 17 and 20), health standards were high and only one examination per stool was carried out. Of 539 recruits examined for *Enterobius* 4.08% were infected. Jaskoski tested the zinc sulphate centrifuging flotation technique, the AEX and alcohol sedimentation techniques and examined direct smears. He found the first method the best. The recently developed MIF (merthiolate-iodine-formaldehyde) staining technique of Saper *et al.* had definite advantages over other commonly used stains. M.MCK.

(184b) In this, the last of four papers summarizing the host and geographical distribution records of parasites from North American rodents, Doran lists the trematodes in alphabetical order together with their hosts and gives a host index in which he includes the nematodes (published in part III). There are 101 references. M.MCK.

(184c) Monaco & Mizelle redescribe *Dactylogyrus banghami* and quote alongside, for comparison, the measurements recorded in the original description. They also describe nine new species of *Dactylogyrus* from North America. In *D. columbiensis* n.sp. from *Ptychocheilus oregonensis* the haptor anchors each consists of a base with well defined superficial and deep roots, the superficial root being longer than the deep root, a solid shaft and a solid point; the wings are conspicuous. The dorsal bar is slightly bent posteriorly in the middle and has rounded ends. The vestigial ventral bar is distinct and tripartite. There are 14 approximately equal hooks [hooklets] and each consists of (i) an elongate-ovate solid base as long as or longer than (ii) a slender solid shaft, and (iii) a sickle-shaped tip with a projecting process on one side and an opposable piece on the other. The cirrus is a thin, tapering, gently curved tube with an expanded base. The closest relative is apparently *D. tridactylus* n.sp., also from *P. oregonensis*. *D. tridactylus* has a similar haptor armature and cirrus but a simpler, antler-like accessory copulatory piece and a less distinct ventral bar. The rounded ends of the dorsal bar are less accentuated than in *D. columbiensis*. *D. hybognathus* n.sp. from *Hybognathus p. placita* has a cirrus remotely resembling that of *D. claviformis* but the accessory piece [which is illustrated but not described] is unlike that of any other known member of the genus. In *D. moorei* n.sp., recorded from *Notropis l. lutrensis* and *N. deliciosus missouriensis*, the cirrus and accessory piece are like those of *D. urus* but the accessory piece of the new species lacks the characteristic distal extremity. The vestigial ventral bar is similar to that of *D. pyriformis* but the median projection is truncate instead of pointed. *D. mylocheilus* n.sp. from *Mylocheilus caurinus* and *Couesius plumbeus dissimilis* has a perforated vestigial ventral bar and a yoke-shaped dorsal bar as in *D. scutatus* and *D. wunderi*. The anchors, hooks [hooklets] and copulatory complex, however, are different. The cirrus is a tapering tube with an expanded base and the accessory piece is conspicuously bent and provided with an expanded terminal portion which partially encloses the distal end of the cirrus shaft. *D. percobromus* n.sp. from *Notropis percobromus* is one of four North American forms with very similar haptor armature. These are *D. orchis*, *D. bifurcatus*, *D. percobromus* and *D. simplex* (Mizelle, 1937) nom.nov. (a new name given to *D. simplex* Mizelle, 1937 to distinguish it from *D. simplex* Bychowsky, 1936), which may be members of a complex. The nearest to *D. percobromus* is *D. simplex* but the accessory pieces, which are Y-shaped in both species, differ somewhat. In *D. ptychocheilus* n.sp. from *Ptychocheilus oregonensis* the accessory piece is similar to that of *D. formosus*. The cirrus is radically different and composed of an enlarged base with a curved tapering tip. The anchors, hooklets and bars are also different. *D. richardsonius* n.sp. from *Richardsonius balteatus* is probably most closely related to *D. attenuatus* which has a remotely similar cirrus and accessory piece. But the robust dorsal bar, anchors, hooks [hooklets] and fragmented ventral bar differ markedly and the size (0.378–0.684 mm.) is relatively larger. *D. vancleavei* n.sp. from *P. oregonensis* and *Achrocheilus alutaceus* is readily distinguished from other species of *Dactylogyrus* by its characteristic copulatory complex. This consists of a long, uniform, tubular cirrus arising from a bulbous structure (prostate?) and it projects through a tube-like accessory piece, the proximal end of which is expanded while the distal end serves as a guide to the cirrus. Although the cirrus resembles that of *D. zandti*, the dorsal and ventral bars are very different. The genus *Neodactylogyrus* Price, 1938 is rejected on the basis of an unreliable, highly variable and vestigial ventral bar. The authors transfer to *Dactylogyrus* six species created by Kimpel in 1939 in a private publication: "Studies on the taxonomy of the genus *Neodactylogyrus*, with descriptions of new species, and the immunity of fresh-water fishes to gill trematodes (Gyrodactyloidea)." The resulting new combinations are *D. campostomus*, *D. phenacobius*, *D. semotilus*, *D. superficialis*, *D. umbratilis* and *D. whipplius*. The presence of a single spicular structure near the centre of the haptor in *Paradactylogyrus* Thapar, 1948 is considered hardly sufficient grounds for generic recognition. Further study

is recommended. The following are considered *nomina nuda*: *D. elongatus* Jacob, 1940, *D. paradoxus* (Creplin, 1838) and the names *D. aequans*, *D. echeneis*, *D. major*, *D. pedatus*, *D. siluri* and *D. trigonodistoma* created by Wagener in 1857. The specificity of *Dactylogyrus* is not as narrow as has been suggested. During the present work specimens of *D. banghami* were recovered from 11 host species belonging to five genera. *D. fallax* has been found in nine genera. Fifty North American species of *Dactylogyrus* are listed alphabetically, each with the person who named it, its host(s) and geographical distribution. A similar list of 64 Old World species and a world list of *Dactylogyrus* hosts are also given. M.MCK.

185—Anais da Academia Brasileira de Ciencias.

- a. VILLELA, G. G. & RIBEIRO, L. P., 1955.—“Hemoglobins of a parasitic nematode of the hen.” 27 (1), 87–89.

(185a) Villela & Ribeiro have demonstrated that the perivisceral fluid of female *Tetrameres confusa* contains a haemoglobin. The absorption spectrum of the oxyhaemoglobin was similar to that of fowl and *Ascaris* haemoglobins. The oxygen consumption of whole *T. confusa* was 2.4 cu.mm. per hour but when the perivisceral fluid was removed this dropped to 0.88 cu.mm. per hour. The average quantity of haemoglobin per worm weighing 75 mg. was 2.8 µg. S.W.

186—Anais do Instituto de Medicina Tropical. Lisbon.

- a. FRANCO, A. & MENEZES, A. DE, 1955.—“A filariase autóctona (*W. bancrofti*) na Ilha de Santiago. (Estudo preliminar.)” 12 (3), 359–393. [English & French summaries pp. 391–393.]

(186a) A survey conducted mainly around Pedra Badejo, Santiago Island, Cape Verde, showed microfilariae of *Wuchereria bancrofti* in the night blood of 265 out of 962 coloured inhabitants. Some of the infected individuals had never left the island. The infection seems to be centred on Pedra Badejo and must be very long established. Of 190 examined for disease 20 had elephantiasis, eight had suspected hydrocele and about half of the diseased showed microfilariae. Microfilariae of *Loa loa* were found in a woman who had lived in Angola. M.MCK.

187—Anales del Instituto de Biología. Mexico.

- a. CABALLERO Y C., E. & BRAVO HOLLIS, M., 1955.—“Tremátodos de peces marinos de aguas mexicanas del Océano Pacífico. VIII. Descripción de tres nuevos géneros de tremátodos monogéneos.” 26 (1), 89–115.
 b. CABALLERO Y C., E., BRAVO H., M. & GROCOTT, R. G., 1955.—“Helminths of the República de Panamá. XIV. Tremátodos monogéneos y digéneos de peces marinos del Océano Pacífico del Norte, con descripción de nuevas formas.” 26 (1), 117–147.
 c. CABALLERO Y C., E., ZERECERO Y D., M. C. & GROCOTT, R. G., 1955.—“Helminths of the República de Panamá. XV. Tremátodos de *Chelone mydas* (L.), tortuga marina comestible del Océano Pacífico del Norte. 2a. parte.” 26 (1), 149–191.

(187a) Caballero & Bravo Hollis describe three new trematode genera from the Mexican Pacific. *Macrovalvitrema sinaloense* n.g., n.sp. from *Micropogon ectenes* is distinguished chiefly by the structure of the clamps. In *Pterinotrematoides mexicanum* n.g., n.sp., also from *M. ectenes*, a single stalk on the opisthaptor carries two small clamps which resemble those of *Macrovalvitrema sinaloense* and there are six larger clamps similar to those of *Pterinotrema macrostomon*. Both new genera belong to the Microcotylidae and are placed in a new subfamily Pterinotrematinae, with *Pterinotrema macrostomon* as the type genus. The subfamily is characterized by (i) a disc-like or wide cup-shaped prohaptor, (ii) the position of the vagina anterior to the ovary, (iii) the shape and position of the reproductive glands and (iv) the fact that some of the suckers are similar in the different genera. *Pseudomazocraes monsvaisae* n.g., n.sp. from *Balistes polylepis*, *Citula dorsalis* and *Argyreiosus brevoorti* resembles *Gastrocotyle*, *Pseudaxine* and *Vallisiopsis* in the structure of the suckers. It has, however, an almost symmetrical opisthaptor with four suckers on each side; the ovary is behind the testes and there are two groups of tubes which appear to be seminal vesicles. M.MCK.

(187b) Caballero *et al.* report some trematodes of fish collected off the Pacific coast of Panama and describe four new forms including one new genus. *Murraytrema pricei* n.sp. from *Muraenesox coniceps* differs from the other species of the genus chiefly in the shape of the cuticular bars on the opisthaptor and the structure of the copulatory apparatus. *Tetrancistrum obesum* n.sp. from *Tetraodon hispidus* is distinguished by the shape of the bars and large hooks of the opisthaptor and by the arrangement of the reproductive organs. *Microcotyloides impudicus* n.sp. from *Polynemus approximans* is distinguished from *M. incisa* by the presence of 70-74 suckers on the opisthaptor, 12 or 13 rings of spines on the cirrus and 9 to 18 testes. The prostatic bulb is lobed. *Botulisaccus pisceus* n.g., n.sp. found in *Albula vulpes* probably belongs to the Monorchhiidae. It differs from the other genera which have two testes in that there is a large robust cirrus sac constricted in the middle and lying obliquely on a level with the equator, the reproductive pores are in a genital atrium behind the acetabulum and the vitellaria extend from the level of the constriction of the cirrus sac to the anterior region of the testes. The authors describe *Lepidapedon elongatum* from *Alphestes multiguttatus*, and *Tubulovesicula muraenesocis* and *Distomum fenestratum* from *Muraenesox coniceps*. M.MCK.

(187c) Caballero *et al.* describe *Pleurogonius americanus* n.sp. and other known trematodes from the marine turtle *Chelone mydas* from the Pacific coast of Panama. The new species has a long, ovoid and slightly curved cirrus sac, a thick sinuous metraterm surrounded by gland cells, and eggs which measure 0.038-0.042 mm. \times 0.019 mm. *P. lobatus* and *P. sindhi* are described; their identification was difficult because the differences between species of *Pleurogonius* are slight. The genus needs to be revised. Other trematodes described are *Pronocephalus trigonocephalus*, *Pyelosomum posterorchis*, *Cricocephalus albus*, *Adenogaster serialis*, *Learedius learedi*, *Orchidasma amphiorchis*, a larval *Calycodes anthos*, *Haemoxenicon stunkardi*, *Schizamphistomoides spinulosum* and *Pachypsolus ovalis*. In the last species the authors found five or six caeca which were long or short, simple, bifurcate or divided into three. *P. tertius* Pratt, 1914 therefore becomes invalid. The muscular structure in *S. spinulosum*, regarded by many authors as a prepharynx, is considered to be the oral sucker, the oesophagus being in fact the prepharynx and the oesophageal bulb the true pharynx. *Haemoxenicon chelonenecon* Martin & Bamberger, 1952 is synonymous with *H. stunkardi* as the differences observed by these authors were due to contractions of the body. M.MCK.

188—Annales de l'Institut Pasteur. Paris.

- a. DESCHIENS, R., 1955.—"Étude comparée des hyperéosinophilies en fonction de leur étiologie." 88 (6), 679-698.

(188a) Deschiens discusses the conclusions he has drawn from his observations on high degrees of clinical eosinophilia in man and experimentally induced eosinophilia in cats, dogs and guinea-pigs. There are two main types of hypereosinophilia, parasitic and non-parasitic, and these may be differentiated by the frequency, intensity, development etc. and by the effect of cortisone and corticotrophin upon them. Parasitic eosinophilia is characterized by the regularity with which it is induced, its persistence and, when the degree of eosinophilia is more than 30%, by its irreducibility by cortisone or corticotrophin. S.W.

189—Annales de Médecine Vétérinaire.

- a. GRÉGOIRE, C. & POUPLARD, L., 1955.—"Synthèses de pathologie parasitaire. I. Les verminoses.—L'immunité antihelminthique." 99 (2), 132-137.
 b. POUPLARD, L. & FIÉVEZ, L., 1955.—"Essai de traitement de l'ascaridiose et de la capillarose du pigeon par l'adipate de pipérazine." 99 (3), 147-159.
 c. POUPLARD, L. & GRÉGOIRE, C., 1955.—"Synthèses de pathologie parasitaire. II. Le diagnostic des verminoses par l'examen des matières fécales." 99 (3), 205-210.

(189a) Grégoire & Pouplard discuss briefly the present knowledge of helminth immunity, with particular reference to the phenomenon of self-cure and the state of premunition. S.W.

(189b) From observations on 26 pigeons, Pouplard & Fiévez conclude that *Capillaria columbae* is far more pathogenic than is *Ascaridia columbae*; they found also that there was a relation between the number of eggs of *C. columbae* present in the faeces and the clinical symptoms but this was not the case with *A. columbae*. The pigeons were treated with 0.3 gm. of piperazine adipate, given in the morning before food on three consecutive days, and this resulted in a considerable drop in the number of eggs in the faeces. Three birds which were clinically very ill were treated a second time with the same dose on four consecutive days resulting in a further fall in egg count. Three other birds died, one before treatment. Another course of treatment was given to 23 pigeons at the same dose rate for six consecutive days but although the egg counts were further reduced, eggs were not completely eliminated from the faeces. No toxic effects were observed. Pigeons heavily infected with coccidia appeared to be more lightly infected with nematodes. S.W.

(189c) Pouplard & Grégoire discuss the diagnosis and estimation of intensity of helminth infections by faecal egg counts. The egg-laying capacity, daily and seasonal variations, pathogenicity, prepatent period, appearance of acquired immunity and the age, state of nutrition and health of the host must all be taken into consideration in the interpretation of results. S.W.

190—Annals of Surgery.

- a. DAGHER, I. K. & HOVNANIAN, A. P., 1955.—“Intrabiliary rupture of hydatid cyst of the liver.” 141 (2), 263–267.

191—Archiv für Hydrobiologie.

- a. MEYL, A. H., 1955.—“Freilebende Nematoden aus binnenländischen Salzbiotopen zwischen Braunschweig und Magdeburg.” 50 (3/4), 568–614.

(191a) Nematodes from soil and water samples from salt biotopes between Brunswick and Magdeburg were examined and the data obtained compared with similar data from Cremlingen, Uhrde and Barnstorf. Meyl found from a survey of soil and fresh-water genera occurring in brackish biotopes that, of the salt tolerant fresh-water species, the aphasmidian fraction is twice as large as the phasmidian. A small group of genera containing certain salt tolerant species is contrasted with a larger group of halophobic species which are never found in brackish habitats. The salt biotope nematodes seem to have originated from marine sources via large salt areas which sea birds habitually visit. Meyl found it possible to classify inland salt nematodes by Gerlach's scheme; for species of marine genera only for the low salt concentrations and for salt resistant fresh-water forms only within broad variable limits. The factors determining the introduction of littoral species appear to be the great variation of salt concentration and resistance to desiccation during the transitional stages, as well as the chemical and edaphic differences of the substrates. Meyl discusses the systematics and autoecology of 46 species, of which seven were found for the first time in salt places. Four species are new to science. These are described and figured and are: *Monhystera multisetosa* n.sp., *Chromadorita* sp., *Dorylaimus andrássyi* n.sp., of whose status he seems a little in doubt and which he identifies with *Dorylaimus* sp. of Andrassy (1952), and *Thornia regiisi* n.sp. with which he synonymizes *Tylencholaimus propinquus* Paesler, 1946. [This should read 1941.] J.B.G.

192—Archiv für Hygiene und Bakteriologie.

- a. GERMER, W. D., SCHULZE, W. & YONG, M. H., 1955.—“Die Epidemiologie der Clonorchiasis, dargestellt an den Verhältnissen in Korea.” 139 (2), 97–108.

(192a) Of nearly 13,000 people examined in the Korean town of Pusan and the adjoining areas of the Nakdong river in 1953 and 1954, 53% to 76% of the adults showed *Clonorchis sinensis* eggs in the stools but only 3% to 47% of the schoolchildren were infected. Country

people, particularly those living along the water-ways, were more frequently infected than town dwellers and the incidence among men was much higher than among women which is attributed to the custom of eating raw fish during drinking bouts. Three methods of treatment were tested but cured only 8 out of 53 patients. Egg counts of the duodenal sediments of 80 people varied from 0.01 to 80 eggs per c.c., and were often very different in the same person at different times. A positive duodenal sample did not necessarily indicate a positive faecal sample and vice versa. The incidence of *C. sinensis* in various provinces of Korea, as shown on a map, ranged from 7% to 35%. The chief areas of infection lie along the larger rivers, the Naktong, Kum, Mankyung and Yung-san. The anatomy and life-cycle of the fluke are described and a table is given of the fishes which act as second intermediate hosts, with their geographical locations (mainly in the Far East) and systematic positions. Random sampling showed that 90% to 100% of the species *Pseudorasbora parva*, *Acanthorhodeus asmusi*, *Macropodus sinensis* and *Misgurnus anguillicaudatus* were infected in Korean waters. The dog is the chief reservoir host.

M.MCK.

193—Archivio Italiano di Scienze Mediche Tropicali e di Parassitologia.

- a. BELLELLI, L., CIAURI, G. & MASTRANDREA, G., 1955.—"Il comportamento delle prove di labilità colloidale nel corso di alcune parassitosi intestinali." 36 (2), 53-64. [English, French & German summaries pp. 63-64.]
- b. LIPPI, M. & TRIPODI, P., 1955.—"Allergia nell'ascaridiosi." 36 (2), 65-104. [English, French & German summaries p. 100.]
- c. BENETAZZO, B. & SALEMME, M. A., 1955.—"Sulle reazioni immunobiologiche sieriche con estratti di *Taenia saginata* e con liquido idatideo in infestati da platelminti e da nematodi." 36 (3), 107-123. [English, French & German summaries pp. 120-122.]

(193a) Bellelli *et al.* performed colloidal lability tests on 52 patients with intestinal parasites (ascarids, *Enterobius*, *Taenia* and hookworms) to determine the state of the protein balance of the plasma. Although only a small proportion showed an abnormal state the authors maintain that they ascertained a derangement of the protein balance in cases of intestinal parasitism.

M.MCK.

(193b) Lippi & Tripodi review the literature on allergic reactions associated with *Ascaris* infections in man. They enumerate the percentage of positive intradermal reactions and complement fixation tests obtained by various workers with ascarid extracts and discuss the reactions which follow the injection of ascarid extracts into animals.

M.MCK.

(193c) Benetazzo & Salemme tested antigens from *Taenia saginata* and *Echinococcus granulosus* on patients infected with these, or *Ascaris*, or *Enterobius* or who were free from infection. They describe in detail the preparation of aqueous and alcoholic antigens from tape-worms. Tested on 21 cases of active *T. saginata* infections the alcoholic extract reacted positively in all but one doubtful and four negative cases and one instance where there was an anticomplementary effect of the serum. Two of the patients were tested again after treatment and one case was still doubtful four months later and a positive case remained so for six and twelve months afterwards. Four who had eliminated *T. saginata* infections over a year before, four out of five with hydatidosis and one out of ten with *Ascaris* gave positive results. The *Enterobius* cases and the controls were negative. The aqueous extract, tested on the same people in the same circumstances, gave essentially similar results. One active infection of *T. saginata* that had previously been negative gave feebly positive results, one of the positive hydatid cases reacted negatively and the positive *Ascaris* case was also negative. Hydatid fluid (Ghedini's reaction) reacted positively in all the hydatid cases, negatively in the nematode and control cases and gave 16 positive, one doubtful and seven negative results among the active and past *Taenia* infections. An anticomplementary effect of the serum was observed in the same patient as before. It was concluded that the aqueous *T. saginata* antigen was slightly better than the alcoholic and that in the absence of hydatid symptoms, a positive reaction to Ghedini's test can be considered diagnostic only after confirmation that there was no previous or present taeniasis.

M.MCK.

194—Arkansas Farm Research.

- a. SLACK, D. A., 1955.—“Plant nematodes—a serious problem.” 4 (2), 5.

(194a) This general article mentions briefly different types of nematodes found in Arkansas. Among those found were *Aphelenchoides besseyi*, *A. fragariae*, *A. oryzae*, *Meloidogyne hapla*, *M. incognita*, *M. incognita* var. *acrita*, *Pratylenchus penetrans*, *Tylenchorhynchus dubius*, *T. claytoni*, *Rotylenchus* sp., *Xiphinema* sp., *Criconemoides* sp. and *Dorylaimus* sp. J.B.G.

195—Arkiv Patologii. Moscow.

- a. ROZIN, S. F., 1955.—[Pathology of unilocular hydatid cyst of the cerebrum.] 17 (2), 68–69. [In Russian.]

196—Arzneimittel-Forschung. Aulendorf.

- a. OELKERS, H. A., 1955.—“Der Wirkungswert einiger pflanzlicher Anthelmintica.” 5 (2), 74–76. [English summary p. 76.]
 b. ZINNER, G., 1955.—“Phloroglucin-Derivate als Inhaltsstoffe wurmwirksamer Drogen.” 5 (3), 123–127. [English summary p. 127.]

(196a) Oelkers tested ten samples of kamala *in vitro* with *Enchytraeus albidus* and found considerable differences in their action. Extracts of Kouso were much less active than kamala or male fern extract. The effect of pomegranate bark was negligible. Khellin stimulated whole worms and isolated muscle but had no toxic effect. *Fasciola hepatica* *in vitro* were markedly less susceptible to kamala and male fern extract than was *Enchytraeus*. A.E.F.

(196b) Zinner reviews the literature on chemical properties of phloroglucine derivatives isolated from male fern, kamala and Kouso, and reports on his own studies. A.E.F.

197—Australian Journal of Zoology.

- a. BREMNER, K. C., 1955.—“Cytological studies on the specific distinctness of the ovine and bovine ‘strains’ of the nematode *Haemonchus contortus* (Rudolphi) Cobb (Nematoda: Trichostrongylidae).” 3 (3), 312–323.
 b. BREMNER, K. C., 1955.—“Morphological studies on the microfilariae of *Onchocerca gibsoni* Cleland & Johnston and *Onchocerca gutturosa* Neumann (Nematoda: Filarioidea).” 3 (3), 324–330.

(197a) Bremner confirms from cytological studies that the sheep and cattle strains of *Haemonchus contortus* are distinct species. The chromosome number for each form is $2n=11$ (male) and $2n=12$ (female) and all the autosomes are 3μ long; the X-chromosomes, however, measure 3μ in the sheep form and 8μ in the cattle form. His observations were made on natural infestations in calves, sheep and goats, experimental pure infestations and experimental mixed infestations. Only three hybrids were found among 77 F_1 females examined after infecting a lamb with 7,000 larvae from sheep and 7,000 from cattle but hybrid females were able to produce viable eggs; there does therefore appear to be a fertility barrier. Some degree of host specificity was also demonstrated. S.W.

(197b) Bremner has studied the morphology of the microfilariae of *Onchocerca gibsoni* and *O. gutturosa*. He observed no significant differences between larvae emerging from adult females and those in the skin. Contrary to previous observations, the size, arrangement and form of the cephalic and caudal nuclei are not constant in either species and are not reliable criteria for identification. Of the many measurements made, only body length was of value as a distinguishing character; for microfilariae from the skin this was 240μ to 280μ (mean 266μ) in *O. gibsoni* and 200μ to 260μ (mean 224.5μ) in *O. gutturosa*; the difference between the means is shown to be statistically highly significant. S.W.

198—Australian and New Zealand Journal of Surgery.

- a. DEW, H. R., 1955.—“Primary cerebral hydatid disease.” 24 (3), 161–171.

199—Australian Veterinary Journal.

- a. ROBERTS, F. H. S., 1955.—"Field trials on the evaluation of tetrachlorethylene as an anthelmintic for cattle." 31 (7), 165-169.
- b. GORDON, H. McL., 1955.—"Some aspects of fascioliasis." 31 (7), 182-189.
- c. HUNGERFORD, T. G., 1955.—"Hexachlorophene for the treatment of tapeworms in poultry." 31 (11), 275.

(199a) The main nematodes associated with gastro-enteritis of cattle in Queensland are *Haemonchus placei*, *Cooperia punctata*, *C. pectinata*, *Bunostomum phlebotomum* and *Oesophagostomum radiatum*. To test the efficiency of tetrachlorethylene against the first four species, 60 cattle were given 60 ml. of a 10% sodium bicarbonate solution to close the oesophageal groove, followed ten seconds later by a 50:50 mixture of tetrachlorethylene and liquid paraffin at a dosage rate of 10 ml., 12.5 ml. or 15 ml. of the drug per 100 lb. body-weight. Treatment was begun when calves were a few months old and repeated every four weeks. The rate of 10 ml. per 100 lb. was highly efficient against *H. placei*, reducing egg counts of about 210-4,400 eggs per gramme to 0-96 e.p.g. in 60% of the cases. As judged by the results against *H. placei*, closure of the oesophageal groove was obtained in 86%. Toxic effects were often observed and one animal died. Against *B. phlebotomum* and *Cooperia* spp. the drug had little effect. M.MCK.

(199b) Gordon discusses in very general terms the problem of *Fasciola hepatica* in Australia. *Simulimnea subaquatalis* is the only vector known there and is found in three types of habitats: the swamps and billabongs on some western rivers of New South Wales, the lakes at the mouth of the Murray and irrigated areas in New South Wales, Victoria and South Australia. It exists without recorded incidence of fascioliasis in the Eyre Peninsula. In one year 44.6% of the livers of a total of 27,098 sheep killed at an abattoir in Sydney (and coming from New South Wales) were condemned. An interesting extract on fascioliasis is quoted from a book by Fitzherbert which was published in 1534. M.MCK.

(199c) Hungerford reports on the treatment of poultry for tapeworms (mainly *Raillietina* spp.) with hexachlorophene. Over 50,000 birds were dosed with tablets containing 50 mg. hexachlorophene, 500 mg. phenothiazine and 50 mg. nicotine. The efficacy varied from 60% to 100%. Doses of one tablet each to otherwise healthy birds were not toxic but there was a high mortality when pullets with blackhead as well as tapeworms were dosed. Egg production was greatly depressed for three weeks after dosing. Doses of two tablets were tested on a number of apparently healthy birds and there were no untoward effects. G.I.P.

200—Boletín de la Oficina Sanitaria Panamericana.

- a. HILBURG, C. J., 1955.—"Control de la anquilostomiasis en el Paraguay." 38 (1), 10-19. [English summary p. 19.]
- b. BURCH, T. A., 1955.—"Proyecto piloto de una campaña de tratamiento médico de la oncocercosis, basado en la administración de suramina sódica (U.S.P. XIII). Parte I. Encuesta pretratamiento." 38 (1), 20-25. [English summary p. 25.]
- c. BURCH, T. A., AGUILAR, G. G., BARRERA, M. & DALMAT, H. T., 1955.—"Proyecto piloto de una campaña de tratamiento médico de la oncocercosis, basado en la administración de suramina sódica (U.S.P. XIII). Parte II. Tratamiento y observación subsiguiente." 38 (2), 141-147. [English summary p. 147.]

(200a) Hilburg outlines the plan of the Paraguayan government for the control of hookworm in the area of Asunción-Villarrica with the technical assistance of the World Health Organization. The area was chosen because it contains approximately 40% of the population and covers 8% of the country's surface. In Asunción 49.9% of 4,287 people examined were infected; 1,788 rarely wore shoes and of these 69.2% were infected. The statistics are analysed according to age, profession and method of faecal disposal. In Villarrica 60.6% were parasitized. The main plan of the campaign is to teach the population the importance of sanitation by visits from trained personnel, illustrated leaflets and moving pictures. Reinforced concrete

slabs with an elongate hole in the middle are being supplied to cover latrine floors, at a cost equivalent to \$1.50 (American) each, to allow for defaecation in the crouching position customary among the inhabitants. Where the soil is too loose to hold for long in the form of a pit, a wicker frame is inserted to line the wall at a cost equivalent to \$0.50 (American). When 80% of rural homes and 95% of urban dwellings have acquired the new sanitation its installation will be made compulsory. Hookworm was probably known to the Guaraní Indians before the Spanish conquest. The Guaraní word "pieboi", described as "itching of the feet" in a Jesuit book of the Indian dialect, is probably traceable to "pi-ceboi", which is being used today and means "feet with small worms".

M.MCK.

(200b) In preparation for a pilot project for the treatment of onchocerciasis with suramin 1,142 inhabitants from coffee plantations in Yepocapa, Chimaltenango, Guatemala, were examined for manifestations of onchocerciasis. None of them had been used in the studies of the Panamerican Office of Sanitation on the evaluation of drugs against this disease. About half of the adults had microfilariae on skin biopsies and one fourth of all the subjects had palpable nodules; 54% of the nodules were on the head, the remainder were fairly evenly distributed on the trunk with only 1% on the limbs. Blindness in one or both eyes occurred in 2.2% and a quarter of the 1,131 subjects interviewed had ocular symptoms. Examination of 1,138 patients of all ages with a slit lamp showed alterations in the conjunctiva, limbus, cornea or iris in 34.3%.

M.MCK.

(200c) 1,043 people at Yepocapa, Chimaltenango, Guatemala were treated for onchocerciasis with suramin sodium. Of the 932 subsequently examined, 450 had received the complete treatment of six to eight intravenous injections containing 0.5-1.5 gm. of suramin each, given singly at intervals of a week; 281 had been given less than six injections and 201, mainly children, had received the drug orally at four or more times the dosage rate of the other patients. Whereas about 35% of the total had demonstrable microfilariae before treatment, 12.3% out of 808 were positive immediately after treatment and only 7.3% were positive of those examined a year later. The incidence of microfilariae among the patients who had received the complete treatment was only 1.9% after a year. The oral treatment in children was unsuccessful. The drug used in this trial reacted more quickly than the brand administered in preliminary tests and was considerably more toxic. Two people died, possibly as a result of the treatment. It is suggested that in future only well established brands should be used except where constant medical supervision is possible. [For abstract of the first part of this paper see No. 200b above.]

M.MCK.

201—Botanical Review.

- a. NEWHALL, A. G., 1955.—"Disinfestation of soil by heat, flooding and fumigation." 21 (4), 189-250.

(201a) Nematodes are dealt with incidentally in the review of methods of soil disinfestation. Nematodes have a relatively low thermal death point (below 80°C.) and in Texas and south California, where soil temperatures may become quite high, it has been suggested that frequent ploughing might effect some control. Steaming of soil is dealt with in detail. Flooding may spread nematodes, for instance *Heterodera rostochiensis* cysts can withstand 15 months in water and *Dolichodorus heterocephalus* prefers wet soils to dry. Much of the review deals with fumigants of which the four most popular are ethylene dibromide, D-D mixture, chloropicrin and methyl bromide. Their use and effects are dealt with. These fumigants show some specificity against nematodes. A dose of ethylene dibromide which kills *Belonolaimus* sp. only kills 50% of *Pratylenchus* sp. Ethylene dibromide appears also to be more specific against *Ditylenchus destructor* than is D-D mixture, while D-D has been found more effective against *Heterodera rostochiensis*. The review concludes with the view that fumigation is still in its empirical infancy.

J.B.G.

202—British Journal of Pharmacology and Chemotherapy.

- a. RAISON, C. G. & STANDEN, O. D., 1955.—“The schistosomicidal activity of symmetrical diaminodiphenoxyalkanes.” 10 (2), 191-199.

(202a) In the first of a series of papers on the schistosomicidal activity of symmetrical diaminodiphenoxyalkanes, Raison & Standen describe tests made against *Schistosoma mansoni* and *S. japonicum* in mice, guinea-pigs and rabbits. The drugs were given orally twice daily for five days, in the first instance at the maximum tolerated dose level or at 200 mg. per kg. body-weight whichever was the smaller; where such doses killed all or some of the schistosomes the experiments were repeated at reduced doses to determine the limits of activity. The animals were killed and examined seven days after treatment. High activity was discovered, the primary amines, monomethylamines and dimethylamines all showing a peak of activity at a chain length (n) of 7-8. The remaining monoalkylamines and dialkylamines (C_2 - C_8) showed peaks at n=4 and n=7-8, and in general showed decreasing activity as the size of the alkyl group increased. Comparative figures were then sought for the activity of lucanthone and tartar emetic following single and multiple oral doses; the *bis*(methylaminophenoxy) heptane was selected for these comparative tests. It was found to be several times as active as lucanthone or tartar emetic when given orally to mice infected with *S. mansoni* or *S. japonicum*. Strict comparison with tartar emetic for total worm mortality was not possible owing to its toxicity. D.L.H.R.

203—British Veterinary Journal.

- a. INNES, J. R. M. & PERUMAL PILLAI, C., 1955.—“Kumri—so-called lumbar paralysis—of horses in Ceylon (India and Burma), and its identification with cerebrospinal nematodiasis.” 111 (6), 223-235.
b. DUNN, D. R., GENTLES, M. A. & WHITE, E. G., 1955.—“Studies on the pig lungworm (*Metastrongylus* spp.). I. Observations on natural infection in the pig in Great Britain.” 111 (7), 271-281.

(203a) Innes & Perumal Pillai review the history of kumri, summarize the published work on cerebrospinal nematodiasis and describe four cases of kumri in horses in Ceylon. Two of these, which were in the early stages of the disease, responded dramatically to treatment with caricide. The post-mortem findings in the brain and spinal cord of the other two are described and illustrated by photomicrographs. In both the pathology was identical with the focal malacia which follows invasion by nematodes; in one horse parts of an unidentified helminth were observed lying on the pia mater at the margin of the lesion and two immature worms, also unidentified, were found in the cerebrospinal fluid. S.W.

(203b) Dunn *et al.* found that of 1,722 pigs examined for lungworms at three bacon factories in Cheshire, London and Hertfordshire, 20.5% were infected. At the Cheshire factory 99 (44%) of 224 consignments (1,238 pigs) contained one or more infected animals. Infection was found in 33 out of 40 consignments from districts in north-western England and North Wales. In bacon pigs the parasites were mainly confined to the caudal end of the diaphragmatic lobe. The lesions appear as lobular areas of emphysema, often accompanied by greyish lymphoid nodules. The histopathological changes in the lung are described and illustrated by photomicrographs. It is suggested that lungworm infection is greatest in young pigs at or shortly after weaning, and that infection in adult pigs is probably residual. The failure of saturated sodium chloride and the advantages of saturated magnesium sulphate as flotation solutions for faecal examinations are discussed. On infected farms a high proportion of the pigs harbour lungworms and infective larvae can be found easily in earthworms. D.M.

204—Bulletin. Connecticut (Storrs) Agricultural Experiment Station.

- a. ANDERSON, M. R. & SHAPIRO, J., 1955.—“Control of the gapeworm in the ring-necked pheasant in Connecticut.” No. 315, 12 pp.

(204a) *Syngamus trachea* parasitizes at least 38 species of birds and a few mammals but its complete life-cycle is not yet fully understood. This bulletin gives a summary of the

various stages of the life-cycle as far as it is known and the symptoms of infection in pheasants. Some methods of control and treatment are discussed and the results are given of field and laboratory trials of soil fumigants. The chemicals used were D-D mixture, Dowfume W-85, chlordane and rotenone. The field tests were made on pheasant farms known to have gapeworm infection but as accurate comparison of the compounds could not be made in the field, laboratory tests were carried out simulating the actual field conditions as closely as possible. The results showed that of the chemicals tested, D-D applied at the rate of 47 gal. per acre was the most effective. Dowfume W-85 at a concentration of 94 gal. per acre was also effective in eradicating gapeworm but rotenone and chlordane, at the concentrations used in the tests, were not. A number of recommendations for the treatment of gapeworm infections are given: (i) pheasants showing symptoms of the disease should be isolated, (ii) infected pens should be treated, starting with the brooder pens, (iii) the soil should be thoroughly treated even when earthworms are not present in large numbers and (iv) D-D should be used either at the rate of 47 gal. per acre or in spot injections of 4 c.c., 12 in. apart, 4 in. deep and in offset rows 6 in. apart.

D.M.

205—Bulletin de l'Institut Français d'Afrique Noire. Série A: Sciences Naturelles.

- a. CAMPANA-ROUGET, Y., 1955.—"Parasites de poissons de mer ouest-africains récoltés par J. Cadenat. IV. Nématodes (1re note). Parasites de sélaciens." 17 (3), 818-839.

(205a) Campana-Rouget reports ten species of nematodes and four genera of nematode larvae from 16 species of selachians collected in West African seas. These helminths belong to the Gnathostomatidae, Physalopteridae and Anisakinae. The cephalic structure of *Proleptus robustus*, which had not been clearly observed before, is shown in apical view and is identical with that of *P. obtusus*. The posterior tip of the left, longer spicule of *P. robustus* is asymmetrically bifid and fans out when the spicule is extruded from the sheath. *Paranisakis* sp. from the intestine of *Trygon margarita* is similar to *P. lophii* and *P. halieutaeae* but the host and body location are different. *Porrocaecum* (*Laymanicaecum*) *pastinacae* found in *T. marmorata* and *Pteromylaeus bovina* is figured and redescribed; the specimens were small and some, curiously, lacked labial denticulations. A key, said to be slightly modified from Skryabin & Shikhobalova, is given for *Porrocaecum* and other genera of the Anisakinae which have one intestinal caecum and no oesophageal appendix. *Dujardinascaris* is divided into two subgenera, viz., *D. (Dujardinascaris)* with a gubernaculum and found in saurians and *D. (Paradujardinia)* to replace the genus *Paradujardinia* Travassos, 1933, which lacks a gubernaculum and is parasitic in cetaceans. *Paranisakis* is a valid genus. As *P. taeniurae* Thwaite, 1927 and *Ascaris quadrata* Linstow, 1905 are identical, *A. quadrata* becomes *Paranisakis quadrata* n.comb. In *Terranova rochalimai* from *Odontaspis taurus* and *Pristis pectinatus* the post-anal papillae were more similar to those of *T. galeocerdonis* than to those of the type specimen and numbered six, instead of five, pairs. The post-anal plate, which was not observed originally by Pereira, had on one specimen spinose and on three others rounded lateral extensions. The body dimensions and other measurements are compared with those recorded by Peireira. M.MCK.

206—Bulletin de l'Office International des Épizooties.

- a. PELLEGRINI & CILLI, 1955.—"L'hydatidose en Italie." 43 (1/2), 34-52.
 b. MIKACIC, D., 1955.—"Contribution à l'épizootologie de l'échinococcose, en Yougoslavie." 43 (1/2), 53-62.
 c. COLOMÓ DE LA VILLA, G., 1955.—"La distomatose en Espagne." 43 (1/2), 63-78.
 d. EUZEBY, 1955.—"Distomatoses." 43 (1/2), 79-83.
 e. PEGREFFI, G., 1955.—"La distomatose (fasciolose)." 43 (1/2), 84-102. [English summary pp. 98-100.]
 f. VAYSSE, J. & ZOTTNER, G., 1955.—"Les strongyloses gastro-intestinales et pulmonaires des ovins et caprins au Maroc." 43 (1/2), 103-108.
 g. ALVES DA CRUZ, A., 1955.—"Les strongyloses pulmonaires et gastro-intestinales du cheptel au Portugal." 43 (1/2), 109-114.
 h. MERLE, A., 1955.—"L'habronémose cutanée en France." 43 (1/2), 170-176.

- i. JORE D'ARCES, 1955.—"La situation sanitaire de l'Algérie à l'égard des maladies parasitaires." 43 (1/2), 177-181.
- j. VITTOZ, R., 1955.—"Généralités sur les parasitoses animales d'intérêt économique en Asie." 43 (1/2), 182-200.
- k. ANON., 1955.—"Les parasitoses à Chypre." 43 (1/2), 201-203.
- l. EDDIN, S., 1955.—"Rapport général sur la situation sanitaire de l'Égypte en ce qui concerne les maladies parasitaires." 43 (1/2), 204-213.
- m. TALAVERA, J., 1955.—"Les maladies parasitaires du bétail en Espagne." 43 (1/2), 214-231.
- n. GASSE, 1955.—"Rapport général sur les maladies parasitaires en France." 43 (1/2), 232-240.
- o. ALTARA, L., 1955.—"Le problème des parasitoses animales en Italie." 43 (1/2), 241-258.
- p. VAYSSE, J., 1955.—"Situation sanitaire au Maroc à l'égard des maladies parasitaires." 43 (1/2), 259-268.
- q. ALVES DA CRUZ, A., 1955.—"Les maladies parasitaires du bétail au Portugal." 43 (1/2), 269-281.
- r. KÜRTPINAR, H., 1955.—"Les parasites et les maladies parasitaires chez les principaux animaux domestiques en Turquie." 43 (1/2), 282-295.
- s. SIMITCH, T. & NEVENITCH, V., 1955.—"Les plus importantes maladies parasitaires des animaux domestiques en Yougoslavie, provoquées par des protozoaires, des helminthes et des arthropodes." 43 (1/2), 296-308.
- t. ANON., 1955.—"Recommendations adopted by the Joint F.A.O.-O.I.E. Meeting (Rome, 4-7 November 1954)." 43 (1/2), 316-322. [Also in French pp. 309-315.]

(206a) [This paper is substantially the same as that published by the authors in *Ann. Sanità pubbl.*, 1955, 16, 81-106. For abstract see *Helm. Abs.*, 24, No. 65a.]

(206b) Although hydatid is found chiefly in the central and southern provinces of Yugoslavia and infects mainly sheep, it also occurs north of the Sava river. It has been found in up to 80% of the pigs killed at the abattoir at Zagreb but seldom in cattle or sheep. Sheep have only been reared north of the Sava during and since the war. They are kept in small numbers without sheep dogs and are not slaughtered on the farms. In eastern Slovenia pigs maintain the cycle by foraging in the woods. Increasing numbers of dogs along the west coast are being treated with arecoline under a compulsory scheme but the results are difficult to assess. A map is given showing the percentages of dogs infected in different regions. M.MCK.

(206c) In Spain the province of Galicia, the Mediterranean coast and areas in the basins of the Tagus, Guadiana, Guadalquivir, Ebro and Segura are heavily infected with *Fasciola hepatica*. During the years 1950-53, 77% of the adult cattle and 80% of the adult sheep which were slaughtered at the León abattoir were severely infected. Hexachlorethane, carbon tetrachloride and mixtures including benzol are, in that order, the commonest anthelmintics and are sold in pills or capsules. To avoid toxic effects which might harm the manufacturer's reputation the anthelmintics are prepared weaker than the optimum concentration. M.MCK.

(206d) In France *Fasciola hepatica* and *Dicrocoelium dendriticum* are the most serious and frequent distomes in domestic animals. The regions of the highest incidence of *F. hepatica* are Sologne, Berry, Saône-et-Loire, Dombes and Camargue. *D. dendriticum* is more widespread. The usual anthelmintics are a turpentine and benzol mixture, carbon tetrachloride, and hexachlorethane against *F. hepatica*, and foudadin against *D. dendriticum*. Prophylaxis is difficult because wild rabbits act as reservoirs. M.MCK.

(206e) Pegreff discusses the distribution and incidence of liver-fluke in Italy and reviews the merits of various prophylactic measures and carbon tetrachloride treatment. He observed that 95% to 97% of some flocks in Sardinia were seriously infected with *Dicrocoelium dendriticum* and whole flocks had sometimes to be killed. At least 1,500 to 2,000 flukes were found per sheep. Equally heavy infections, however, had been found in otherwise healthy animals. Three groups of about 70 sheep with *Fasciola hepatica* were removed for two weeks in March from their usual pasture. During their absence it was treated with calcium cyanamide, at the rate of 120 kg. per hectare. The fluke eggs were eliminated from the faeces by carbon tetrachloride treatment. No further measures were taken for 18 months. The animals improved in health, remained free of *F. hepatica*, and the eggs of gastro-intestinal strongyloids also disappeared from the faeces. The use of chemical fertilizers as molluscicides and larvicides is considered worthy of further investigation. M.MCK.

(206f) Vaysse & Zottner review the treatments given for gastro-intestinal trichostongyles and for lungworms in sheep and goats in Morocco. The most important are *Haemonchus contortus* and *Cystocaulus ocreatus*. Orders were placed for 70 tons of phenothiazine in 1953, which is equivalent to the treatment of six million animals. M.MCK.

(206g) Alves da Cruz discusses the strongyloids of farm animals in Portugal, some other helminths associated with these nematodes and the chief methods of treatment. Lungworms occur in sheep all over Portugal and cause high mortality; in pigs they are most serious in the south where the animals are reared in the open in large herds. *Oesophagostomum radiatum* is important in cattle. As a result of gastro-intestinal infections, chiefly caused by *Haemonchus contortus*, 30% of the lambs and up to 80% of the flocks have died in infected regions. M.MCK.

(206h) Summer sores are caused in France mainly by *Habronema megastoma*. They are common along the Mediterranean coast, in the departments of Aude, Hérault and Gard, where they cause the most serious disease of horses. At altitudes above 300m. the disease is unknown but along the coast and waterways the incidence reaches 60%. Horses in the mines contract the infection when they are brought to the surface in August. Although the vectors abound under ground the infections subside when the horses return down the mines. The small horses of the Camargue are not attacked. Radiotherapy was successfully used at the Veterinary School of Toulouse in 1952, where horses were given two 10-minute exposures, eight days apart, to 94 R-minutes at a distance of 20 cm. M.MCK.

(206i) Pulmonary and gastro-intestinal nematodes infect nearly all the sheep in Algeria. The animals suffer from malnutrition and up to 40% to 50% of the adults and 70% to 75% of the lambs may succumb. In 1952, 13.5 tons of phenothiazine were distributed free under a government scheme. Subcutaneous injections of carbon tetrachloride in an oily solution have given encouraging results in sheep that were not yet underweight. Hydatid is wide-spread and in the abattoirs of Algeria it was responsible for the rejection of about 56 tons of infected organs out of a total kill of 15,635.3 tons in 1952. M.MCK.

(206j) North of the 30th parallel in Asia the parasites of domestic animals are similar to those found in the Mediterranean basin. South of the 30th parallel infections are heavier and the parasites often different. Here *Fasciola hepatica*, *F. gigantica*, *Dicrocoelium dendriticum*, *Eurytrema pancreaticum*, *Paramphistomum explanatum* and *P. cervi* are responsible for 70% of the parasitic infections of cattle, equines, zebu and buffaloes. A list of the parasites recorded from these animals and from sheep, goats, pigs and poultry in Asia shows which occurred north, and which south, of the 30th parallel. M.MCK.

(206k) Parasitic gastro-enteritis of sheep and goats is the most important parasitic disease in Cyprus. *Fasciola hepatica* is found chiefly in Morphou, Mammonia Valley and at Singrasi, outside Trikomo. Hydatidosis occurs all over the island. M.MCK.

(206l) In a comprehensive review of the parasites of domestic animals in Egypt, Eddin notes that strongyloids occur in 88% of the equines. *Parascaris equorum* is more common in Lower Egypt and *Habronema* in Upper Egypt. Liver-flukes infect ruminants along the water-ways in Lower Egypt, at El Faiyum, in parts of Guizeh and the oases of Dakhla and Kharga. Some sheep flocks in the northern delta are 100% infected with strongyloids and liver-flukes. Other important helminths include *Ascaris* and *Cysticercus* in the pig, *Echinococcus* cysts and *Dipetalonema evansi* in the camel, and *Ascaridia galli* in poultry. M.MCK.

(206m) Talavera lists the helminths recorded from farm animals in Spain and discusses their importance and control. *Dictyocaulus filaria* and *Metastrongylus apri* are wide-spread in the central and southern regions. In Estremadura and Andalusia, *Ascaris lumbricoides* has caused severe losses among piglets. The highest incidence of hydatid in 1948 and 1949 was 40.6% in the sheep killed at the abattoirs of Palencia. M.MCK.

(206n) Gastro-intestinal nematodes and lungworms in sheep and goats are the most serious helminths in France. *Haemonchus contortus* is found in all the sheep-rearing districts. *Moniezia expansa* is extremely common in certain regions, e.g. Crau, Bourgogne and the mountains of Lyonnais. Serious infections are caused by larvae of *Oesophagostomum* in cattle and of *Trichonema* in horses. Broncho-pulmonary worms and ascarids occur frequently in poultry and pigs. M.MCK.

(206o) In Italy attention has been concentrated on the bacterial and virus diseases of animals, to the unfortunate neglect of parasitic infections. Liver-fluke and *Echinococcus* are wide-spread. Pulmonary and intestinal nematodes are serious in sheep in the southern, central and insular regions; the mortality sometimes reaches 40% and the incidence 100%. In Sardinia *Synthesetocaulus rufescens* has recently been observed. M.MCK.

(206p) Vaysse tabulates the common parasites of farm animals in Morocco. *Echinococcus* cysts and *Cysticercus bovis* occur frequently in bovines. Although strongyloids produce the most serious infections in sheep and goats, *Moniezia expansa* may cause a high mortality among lambs. Liver-fluke infection, common in such districts as Rabat and Fez, is treated with carbon tetrachloride which is supplied free; hexachlorethane treatment has barely begun. M.MCK.

(206q) In addition to lungworms, gastro-intestinal nematodes, liver-flukes and hydatid, the helminths of veterinary importance in Portugal include cestodes in cats and dogs, *Coenurus cerebralis*, *Parascaris equorum*, *Macracanthorhynchus hirudinaceus*, *Ascaris lumbricoides*, *Ancylostoma caninum*, *Dirofilaria immitis* (in certain regions), *Cysticercus cellulosae* which is wide-spread in the interior of the country and *C. ovis*. The latter has only recently been reported from Portugal. *Moniezia expansa* occurs in 95% of the sheep in some regions south of the Tagus. M.MCK.

(206r) Kurtpinar lists and discusses the parasites recorded from horses, cattle, sheep and goats in Turkey. *Fasciola hepatica* and *Dicrocoelium dendriticum* are important but *F. gigantica* has only recently spread from the Middle East. Although 30% of the sheep and goats die from gastro-intestinal nematode infections the State Veterinary Services do not administer phenothiazine because of its high price. Copper sulphate is the anthelmintic in use. Kurtpinar has found *Ostertagia occidentalis* in Turkey. M.MCK.

(206s) *Cysticercus* spp. and *Echinococcus* are common in the whole of Yugoslavia except Slovenia. In some places 50% of the sheep, cattle and pigs are infected with *C. tenuicollis*. In parts of Bosnia and Kosmet, *C. bovis* has an incidence of 10% to 20% and *Taenia saginata* occurs in 3% to 16% of the human population. Strongyloids, ascarids and *Moniezia expansa* cause serious losses and liver-flukes are found throughout the country. *Dicrocoelium dendriticum* is transmitted mainly by *Zebrina detrita*, and *Fasciola hepatica* by *Limnaea truncatula*. M.MCK.

(206t) The joint meeting of the Food & Agriculture Organization and the Office International des Épidémiologies gives the therapeutic and prophylactic measures that should be adopted in countries where hydatid, liver-flukes and strongyloids cause grave losses. The meeting recommends that animal nutrition should be studied in relation to resistance to infection and that prophylactic measures be studied in the schools along the lines specified by the Veterinary Service. M.MCK.

207—Bulletin de la Société de Pathologie Exotique.

- a. SCHWETZ, J., 1955.—"Infection expérimentale d'un rat de maison (*Rattus rattus*) et d'un rat sauvage (*Mastomys coucha*) par *Schistosoma rodhaini*." 48 (2), 180-182.
- b. SCHWETZ, J., 1955.—"Sur l'infection naturelle des rats domestiques (*Rattus rattus*) par *Schistosoma mansoni* en Afrique Centrale." 48 (2), 182-185.
- c. BATAILLARD, M., 1955.—"Essai de traitement de la bilharziose vésicale par un ascorbo-hypophosphito-antimonio-tartrate de calcium et de potassium." 48 (2), 192-195. [Discussion pp. 195-196.]

- d. BELLON, J., 1955.—"Essai de traitement de la bilharziose intestinale par l'oxyde stanneux." 48 (2), 197-201.
- e. DESCHIENS, R. & LAMY, L., 1955.—"Préhension et ingestion des mollusques vecteurs des bilharzioses par les écrevisses du genre *Cambarus*." 48 (2), 201-203.
- f. DESCHIENS, R., DECHANCE, M. & VERMEIL, C., 1955.—"Action prédatrice des crabes d'eau douce du genre *Potamon* sur les mollusques vecteurs des bilharzioses." 48 (2), 203-207.
- g. DESCHIENS, R. & LITALIEN, F., 1955.—"Le test à l'A.C.T.H. dans les éosinophilies parasitaires à taux modéré." 48 (2), 222-226.
- h. SCHWETZ, J., BAUMANN, H. & FORT, M., 1955.—"*Planorbis metidjensis* Forbes = *Planorbis corneus metidjensis* Forbes = *Planorbis dufouri* Graells: hôte intermédiaire expérimental de *Schistosoma mansoni*." 48 (3), 344-346.
- i. GALLIARD, H., DESCHIENS, R., FLOCH, H. & LITALIEN, F., 1955.—"Étude comparée du test de Thorn à l'A.C.T.H. chez des sujets de race mélanoderme et de race leucoderme." 48 (3), 377-384.
- j. CAVIER, R. & GAULIN, J., 1955.—"Un nouvel anthelminthique: le dilaurate de diéthylène-diamine." 48 (3), 393-395.
- k. DECHANCE, M. & DESCHIENS, R., 1955.—"Action des sels de fer sur les mollusques vecteurs des bilharzioses." 48 (4), 470-473.
- l. GALLIARD, H. & BRYGOO, E. R., 1955.—"*Microfilaria bancrofti* var. *vauceli*, variété nouvelle de la Côte Sud-Est de Madagascar." 48 (4), 473-475.
- m. TAUFFLIEB, R., 1955.—"Une campagne de lutte contre *Simulium damnosum* au Mayo Kebbi." 48 (4), 564-576.

(207a) By experimental infection of one albino *Mastomys coucha* and one *Rattus rattus*, Schwetz confirmed that schistosome cercariae emitted by *Planorbis tanganikanus* from a riverside marsh near Lake Tanganyika were those of *Schistosoma rodhaini*. Forty days after exposure to the cercariae numerous eggs of *S. rodhaini* were recovered. S.W.

(207b) Schwetz examined 122 domestic *Rattus rattus* at Albertville and found two out of the 33 collected in the Kapemba-Lukuga quarter to be infected with *Schistosoma mansoni*. The eggs were identical with normal *S. mansoni* eggs and did not resemble those of the variety peculiar to rodents. S.W.

(207c) Bataillard tested A.B.5 ("ascorbo-hypophosphito-antimonio-tartrate de calcium et de potassium") on 20 patients, between 7 and 17 years old, with schistosomiasis haematobia. Treatment lasted for five consecutive days and consisted daily of one intravenous injection of 5 c.c. and two tablets for those under 40 kg. body-weight, and one injection of 10 c.c. and three tablets for those over 40 kg. When given orally the drug was well tolerated but the injections produced a number of unpleasant side effects. Immediate results appeared to be excellent although two patients continued to pass eggs. Of those apparently cured 16 were followed up for periods of three to six months and in five eggs reappeared in the urine although it was thought unlikely that reinfection had taken place. In the discussion Schneider stated that in four out of five patients he had treated with the drug eggs reappeared after six to eight weeks, although in these cases reinfection had definitely not occurred. S.W.

(207d) Although he has tested it on only a small number of cases, Bellon is of the opinion that stannous oxide shows promise in the treatment of schistosomiasis mansoni, particularly where the treatment of a large number of carriers without taking them into hospital is desirable. Of the ten cases he treated eight received a total dose of 4 gm. during eight days, the two others receiving smaller doses. There were no side effects except in two cases where vomiting occurred during the first days of the course. In most of the patients one course was sufficient to eliminate eggs from the faeces and this was maintained on subsequent examinations. There was marked improvement in the general condition. One out of the three who were still positive after the first course was given a second course of treatment which was successful. S.W.

(207e) Deschiens & Lamy describe their observations on the crayfish *Cambarus affinis* feeding on aquatic snails. They are of the opinion that the introduction of this crustacean into canals, irrigation ditches etc. in regions where schistosomiasis is endemic would be a useful auxiliary method of control. S.W.

(207f) Deschiens *et al.* have studied in the laboratory the predation of the crab *Potamon* on aquatic snails, and compared it with that of *Cambarus*. Although in the laboratory the crabs did not appear as voracious as the crayfish it is possible that under natural conditions they would be more effective in controlling schistosome intermediaries. An attempt was made to keep *Potamon* and *Cambarus* together but this was not successful. S.W.

(207g) Deschiens & Litalien performed Thorn tests on 14 patients with helminth infections. They found that when the hypereosinophilia is less than 20% it is usually reducible but when it is more than 70% it is usually irreducible under the same conditions. Coloured people with filarial infections are exceptions to this rule. The reaction may be related to the degree of fatigue or damage of the suprarenal cortex. S.W.

(207h) By reproducing the cycle of *Schistosoma mansoni* in specimens of *Planorbis dufouri* (= *P. metidjensis*) descended from Lisbon stock, Schwetz *et al.* demonstrated the capacity of this snail to transmit *S. mansoni* as well as *S. haematobium*. They wonder whether *P. corneus*, which is anatomically similar to *P. dufouri*, can transmit both species. M.MCK.

(207i) Whereas 3 out of 20 unparasitized white people reacted negatively to Thorn's test, 16 out of 34 coloured individuals did so. This seems to indicate a lower cortico-adrenalin activity in coloured people and they are known to be refractory to the reduction of eosinophilia by hormone treatment. M.MCK.

(207j) Nine diethylene-diamine salts of saturated fatty acids (from C_{10} to C_{18}) were tested as anthelmintics on *Rhabditis macrocerca* in coprocultures and on oxyurids in mice. Two fulfilled in lowest concentrations the initial requirements, i.e. the dilaurate and dimyristate, at 0.33 parts per thousand, killed half of the *R. macrocerca* batches in 30 minutes and at the rate of 37.5 mg. per kg. eliminated all the oxyurids in mice injected rectally with 0.75 c.c. per day for seven days. The amount of dilaurate which proved lethal to 50 out of 100 mice was 11.6 mg. per kg., giving a $\frac{C}{T}$ value of $\frac{1}{309}$. Glutinated granules of the dilaurate were administered orally to children in the morning on an empty stomach at a dose rate of 0.36 gm. per day. This was supplemented in some cases with suppositories containing 0.05 gm. of dilaurate and 5 mg. of amyleine chlorhydrate to avoid local irritation. Treatment lasted three days and was repeated after two weeks. Of 30 *Enterobius* cases 28 were cured, 20 after one treatment; six out of 10 *Ascaris* cases became negative, three after one treatment. Simple oral treatments were as effective as with suppositories and no toxic effects were observed. The drug is recommended as an anthelmintic for *Enterobius*. M.MCK.

(207k) Dechancé & Deschiens have shown in a laboratory experiment that ferric chloride at 0.065 gm. per cent and ferric sulphate at 0.5 gm. per cent are toxic to *Bulinus contortus* and *Planorbis glabratus*. *B. contortus* was more susceptible. Fish tolerated concentrations of iron salts which killed the snails. Those snails which survived 48 hours in the solutions were not killed by more prolonged immersion and after 10 to 15 days they became active again and fed normally. The continued use of molluscicidal chemicals may thus produce races of snails with increasing resistance to them. S.W.

(207l) Galliard & Brygoo give a preliminary description of *Microfilaria bancrofti* var. *vauceli* n.var. from man in Madagascar. The microfilaria is morphologically intermediate between *Wuchereria bancrofti* and *W. malayi* and the characters of all three are set out in tabular form. S.W.

(207m) Having established the limits of the onchocerciasis zone in the Chad territory and the distribution within it of *Simulium damnosum*, a control campaign was initiated which included treatment of infected persons and an intensive attack on the vector. This was directed against both adults and larvae and was carried out during the dry season when the distribution of *S. damnosum* is strictly localized. The adult flies were attacked by spraying from helicopters

with a benzene hexachloride preparation and the larval stages by introducing the same chemical into the water. The immediate results were extremely satisfactory, larvae completely disappeared, none of the nymphs collected gave rise to adults and no adults were found in the three treated zones. Final results will not be known until after the end of the next rainy season in November or December of 1955. S.W.

208—Bulletin de la Société Zoologique de France.

- a. ARVY, L. & BUTTNER, A., 1955.—“Cycle évolutif de *Diplostomulum phoxini* (Faust, 1918) (Diplostomatidae).” [Demonstration.] 80 (2/3), 104–105.
- b. CHABAUD, A. G. & BIOCCA, E., 1955.—“Vicariances spécifiques (et non génériques) chez des oxyures parasites de *Xerus* africains. Description de *Syphacia transafricana* n.sp. et division du genre *Syphacia* Seurat 1916.” 80 (2/3), 124–131.
- c. JOYEUX, C. & BAER, J. G., 1955.—“Cestodes d'oiseaux récoltés dans le centre de la France.” 80 (2/3), 174–196.

(208a) [For abstracts of fuller accounts of this work see Helm. Abs., 23, Nos. 246a & 356d.]

(208b) Chabaud & Biocca have observed that whereas the same two genera of oxyurids (*Dermatoxys* and *Syphacia*), are common to *Xerus* in Dakar and Somalia and *Atlantoxerus* in Morocco, the same two species are common only to Dakar and Somalia. They describe and give drawings of *Syphacia transafricana* n.sp. from *Xerus erythropus* from Dakar (type host and locality) and *X. rutilus* from Somalia. The new species is most closely related to *S. pallaryi* but may be distinguished by several characters, particularly by the form of the gubernaculum and the ventral ornamentation of the male. The genus *Syphacia* is divided into two subgenera, *Syphacia* with three papillae on the ventral surface of the male and parasitic in Muridae or rarely in other rodents, and *Syphatineria* n.subg. with two papillae and parasitic in Sciurinae. S.W.

(208c) Joyeux & Baer list, under their hosts, the cestodes collected from birds in the region of Charnes in central France. *Anomotaenia brevis*, *Choanotaenia galbulae*, *C. passerina*, *C. muscosa*, *Anonchotaenia globata*, *Hymenolepis crenata* and *H. naja* are annotated or re-described. *C. oriolis* n.sp. from *Oriolus oriolus* in Switzerland is distinguished from *C. passerina* by the number and form of the hooks, by the number of testes and by the length of the cirrus pouch. *C. spinoscapite* n.sp. from *Sturnus vulgaris*, *Turdus merula*, *Pica pica* and *Garrulus glandarius* is differentiated from other species of *Choanotaenia* by the size of the hooks and the cirrus pouch, by the number of testes and by the presence of numerous spines on the scolex. One specimen of *Hymenolepis upuparum* n.sp. was collected from *Upupa epops* and is described and compared with *H. septaria*, from which it differs apparently only in the size of the eggs. The type specimens of *H. septaria* were not available for comparison but when this species is better known, *H. upuparum* may prove to be synonymous. A note draws attention to an error made in the description of *Raillietina* (*Raillietina*) *frontina* in 1936, the onchospheres being 16 μ not 96 μ in diameter and the hexacanth hooks 7 μ in length. There are a number of new host records. S.W.

209—Bulletin of the World Health Organization.

- a. CHOW, C. Y., THEVASAGAYAM, E. S. & WAMBEEK, E. G., 1955.—“Control of *Salvinia*—a host plant of *Mansonia* mosquitoes.” 12 (3), 365–369. [French summary p. 369.]

(209a) In Ceylon *Salvinia auriculata* was introduced accidentally from India before 1940 and has now over-run thousands of acres of paddy fields: it is an important host plant of mosquitoes of the genus *Mansonia* which are the main vectors of *Wuchereria malayi* in Ceylon. Spraying with pentachlorophenol (12% to 16% PCP) at a dosage rate of 8–10 U.S. gallons per acre (diluted with water to give a spray of 160 U.S. gallons per acre) killed all young plants and most of those in the middle stages of development in seven to ten days. Two applications were necessary for fully grown plants. S.W.

210—Cactus and Succulent Journal of Great Britain.

- a. GILBERT, C. E. L., 1955.—“A new major cacti pest.” 17 (3), 56-57.

(210a) Both *Meloidogyne* spp. and *Heterodera cacti* have been found to attack cacti and may be the cause of much unthriftness attributed to other causes. The author has had some success in controlling the parasites by treatments for 10 minutes in water at 120°F. to 125°F. M.T.F.

211—California Agriculture.

- a. ALLEN, M. W., BURTON, V. & GEORGE, A., 1955.—“Control of nematode on cotton. Investigations indicate preplanting fumigation of cotton land effective treatment for control of root-knot nematode.” 9 (11), 10, 14.

(211a) Pre-planting fumigation treatments of cotton fields infested with *Meloidogyne incognita* var. *acrita* were carried out with two new nematicides, N-339 and OS-1897 (1,2 dibromo-3-chloropropane) and compared with standard D-D mixture and ethylene dibromide treatments. The soil was a light sandy loam with the temperature at 56°F. to 60°F. and moisture content was at field capacity at the time of treatment. Cotton was planted 10 to 14 days after treatment. N-339 was not as good as D-D or EDB in controlling nematodes or in increasing the yield of cotton, but OS-1897 compared favourably with them. In area treatments OS-1897 at 1.25 gal. per acre gave better results than EDB at 5.5 gal. or D-D at 20 gal. In row treatments OS-1897 was effective at a dosage of 0.5-1.0 gal. per acre which is considerably less than that required for EDB or D-D to be effective. M.T.F.

212—California Citrograph.

- a. SHER, S. A., 1955.—“Nematodes attacking avocados.” 40 (5), 198.
b. AYERS, E. L., 1955.—“Serious decline problem confronting Florida citrus.” 40 (10), 364, 369.

(212a) Sher reports that *Trichodorus* sp. has been shown to multiply around the roots of avocados and to feed on them. He lists several other genera of nematodes of which species have been found around avocado roots. M.T.F.

(212b) The burrowing nematode, *Radopholus similis*, is the cause of a condition of decline in many Florida citrus orchards. The nematode is said to spread at the rate of 50 ft. per annum. The only treatment which can be recommended is the removal and burning of affected trees and the surrounding apparently unaffected ones and treatment of the soil with a fumigant followed by a 1-2 year fallow. M.T.F.

213—Canadian Journal of Zoology.

- a. WU, L. Y., 1955.—“The development of the stichosome and associated structures in *Trichinella spiralis*.” 33 (6), 440-446.

(213a) In *Trichinella spiralis* the presumed precursors of the stichocytes are indistinct cuboid cells which can be seen in larvae recovered from mice six days after infection. The stichocytes form into two longitudinal rows above the oesophagus. The cells become pyramidal with the apices facing inwards and dovetailed along the mid-line. The tips continue to grow towards the opposite border, curve downwards round the broad end of the adjacent cell of the opposite row and then upwards again reappearing like separate cells. This and the development of a second nucleus in each stichocyte results in an apparent duplication of the number of cells. The stichosome thus consists of 24 to 30 coiled, binucleate gland cells. The intestinal gland cells originate as two cuboid cells which develop separately into two cells looping around the junction of the oesophagus and intestine. M.MCK.

214—Central African Journal of Medicine.

- a. RITCHKEN, J., 1955.—“The fevers of Africa. I. Bilharzial fever.” 1 (1), 37–42.

(214a) The allergic condition which often appears four to ten weeks after a schistosome infection is characterized by urticaria, fever, eosinophilia and general symptoms of ill health; it has been variously called River fever, Yangtse River fever, urticarial fever or the Katayama syndrome. Each of the various features as seen in Rhodesia is succinctly described and accompanied by an illustrative case report. A history of exposure is often lacking. Treatment should not be initiated until the discovery of eggs or two to four months after the onset of the fever, unless a clear history of exposure can adequately account for the clinical picture. R.T.L.

215—Československá Hygiena, Epidemiologie, Mikrobiologie, Imunologie.

- a. GLOCMAN, K., 1955.—“Epidemiologické a hygienické poznámky k helminthiasám.” 4 (4), 206–211. [English & Russian summaries p. 11.]

(215a) Of 1,606 children, one to seven years old, from 41 kindergartens and 15 nurseries in Ustí 93% were infected with *Enterobius vermicularis*, 7% with *Trichuris trichiura* and 1.6% with *Ascaris lumbricoides*. *Hymenolepis nana* was found in two cases. Contamination with helminths was insignificant in nurseries, rose in urban kindergartens and reached its maximum in rural kindergartens. G.I.P.

216—Ceylon Veterinary Journal.

- a. SENEVIRATNA, P. & SENEVIRATNE, D., 1955.—“Preliminary observations on helminth infections of domestic poultry in Ceylon.” 3 (2), 51–53.
 b. SENEVIRATNA, P., 1955.—“Observations on helminth infections in cats in Kandy district, Ceylon.” 3 (2), 54–58.
 c. MCGAUGHEY, C. A., SENEVIRATNA, P. & SENEVIRATNE, D., 1955.—“Preliminary prophylactic trials against kidney worms (*Stephanurus dentatus*) with caricide (Lederle.)” 3 (2), 61–62.

(216a) Seneviratna & Seneviratne report on the nature and incidence of helminth infections of domestic poultry of different ages and sexes reared under different conditions in or near Kandy, Ceylon. The following nematodes are recorded: *Oxyuris mansoni*, *Cheilosporira hamulosa*, *Dispharynx nasuta*, *Syngamus trachea*, *Gongylonema ingluvicola*, *Tetrameres americana* (?), *Ascaridia* spp., *A. galli*, *Capillaria annulata*, *C. columbae* and *Heterakis gallinae*. The cestodes recorded are: *Raillietina echinobothrida*, *R. tetragona*, *R. magninumida*, *Hymenolepis* spp., and *H. carioca*. Birds reared in the battery or deep litter systems showed light infections. Farm birds reared unhygienically in pens were heavily infected especially with *Ascaridia galli*, *Syngamus trachea* and *Raillietina* spp. Birds that had a free range of existence showed heavy infection, chiefly with *Raillietina* spp. and with *Oxyuris mansoni* and other spirurids. The incidence of *Ascaridia galli* and *Heterakis gallinae* in them was very low. The authors are of opinion that there is no relation between the extent and incidence of intestinal nodules and infection with *Raillietina echinobothrida* and that some of the nodules are probably due to Hjarre's disease. H.C.

(216b) Seneviratna found the following helminths in an examination of 36 cats from the Kandy district in Ceylon: *Ancylostoma braziliense* (69.4%), *Anafilaroides rostratus* (61.1%), *Taenia taeniaeformis* and *Dipylidium caninum* (50%), *Ancylostoma caninum* (30.6%), *Toxocara cati* (25%), *Physaloptera praeputialis*, *Physaloptera* spp. and *Syngamus auris* (16.7%), *Dipylidium caninum*, *Toxocara canis*, *Syngamus mcgaugheyi* and *Orchipeum isostoma* (13.9%), *Taenia novella* (?) (5.5%), *Metagonimus yokogawai*, *Spirocerca lupi* and *Capillaria* sp. (2.8%). The lung nematode *Anafilaroides rostratus*, found only in those cats that were over six months old, is briefly redescribed. Its development in the foot of the molluscs *Achatina fulica*, *Mariella dussumieri* and an unidentified slug is recorded. The specific name *Syngamus mcgaugheyi* Seneviratna, 1954 is corrected to *S. mcgaugheyi*. H.C.

(216c) In a controlled experiment, McGaughey, Seneviratna & Seneviratne found a statistically significant association between treatment of piglets with 1-diethylcarbamyl-4-methyl piperazine dihydrogen citrate (caricide) and infection with *Stephanurus dentatus*. Twelve piglets given 25 mg. per kg. body-weight of caricide on one day, on two consecutive days or on three consecutive days a month in two consecutive months were reared to weaning age with sows infected with kidney-worms. At the end of six months none of the piglets showed any infection with *Stephanurus dentatus*, whereas three out of five control piglets were found to be infected. The authors are of the opinion that the absence of any statistically significant increase in the weights of the piglets was probably due to *Metastrongylus apri* and *Salmonella* which were also present in the herd. H.C.

217—Chinese Medical Journal.

- a. CHUNG, H. L., WENG, H. C. & HOU, T. C., 1955.—“Immunodiagnosis and chemotherapy of clonorchiasis sinensis, with especial reference to efficacy of chloroquine including a note on negative effect of oxychloroquine.” 73 (1), 1-14.
- b. CH'IN, K. Y., LEI, A. T. & WANG, T. Y., 1955.—“Primary mucinous carcinoma of liver associated with *Clonorchis sinensis* infection.” 73 (1), 26-35.
- c. CH'EN, M. H., 1955.—“Roentgenological diagnosis of paragonimiasis.” 73 (1), 36-46.
- d. CHUNG, H. L., WENG, H. C., HOU, T. C. & HO, L. Y., 1955.—“The value of complement fixation test and intradermal test in the diagnosis of paragonimiasis.” 73 (1), 47-54.

(217a) Chung *et al.* have studied nine cases of clonorchiasis and present the clinical data in a series of tables. For quantitative diagnosis the microscopic examination of the entire sediment of centrifuged bile was the most reliable. An antigen was prepared from a saline extract of whole adult *Clonorchis sinensis* and used for complement fixation and intradermal tests. Sera from four cases were tested with the *Clonorchis* antigen and with a *Schistosoma japonicum* antigen and from two cases with a *Paragonimus westermanii* antigen; two were positive to the first, all were negative to the second and one was positive and one doubtful to the third. Sera from four uninfected persons were negative to all three antigens. Intradermal tests were performed on nine cases with the same three antigens and on seven with a *Fasciola hepatica* antigen; all tested were positive to the *Clonorchis* antigen and the *Fasciola* antigen, eight were positive and one doubtful to the *Paragonimus* antigen and one was doubtful and eight negative to the *Schistosoma* antigen. Control injections of normal saline produced no reactions and nine normal individuals showed a negative response to all four antigens. Treatment with chloroquine (total dose 19.5 gm. to 39.0 gm. in divided doses over a period of from 20 to 53 days) was completely successful in seven out of the eight cases who completed the treatment and who were observed for periods of from two to seven months after the end of treatment; one case relapsed. Oxychloroquine had no effect in one case in which it was given. S.W.

(217c) Ch'ien describes the X-ray findings in 61 cases of paragonimiasis. Two characteristics of the disease which are apparent on the X-ray films are vacuoles and perifocal radiating lines of fibrosis. From his observations Ch'ien suggests that pulmonary paragonimiasis should be divided into four stages, infiltrative, nodular or cystic, fibrotic and calcified. The differential diagnosis of paragonimiasis, pulmonary tuberculosis, tumour of the lung and bronchiectasis is discussed. S.W.

(217d) Chung *et al.* describe the preparation of antigen from adult *Paragonimus westermanii* and its use in complement fixation and intradermal tests. Sera from 13 cases of paragonimiasis reacted positively to complement fixation tests, irrespective of cerebral involvement. Cerebrospinal fluid from ten patients was tested for complement fixation and the five cases in which there was cerebral involvement all reacted positively, whereas the cerebrospinal fluid of the five patients without cerebral involvement was negative. Intradermal tests on the 13 cases were uniformly positive. S.W.

218—Chromosoma. Berlin & Heidelberg.

- a. NIGON, V. & BRUN, J., 1955.—“L'évolution des structures nucléaires dans l'ovogenèse de *Caenorhabditis elegans* Maupas 1900.” 7 (2/3), 129-169.

(218a) Nigon & Brun have made an extensive study of the nucleus during oogenesis in *Caenorhabditis elegans*. The first part of the paper describes the meiotic divisions in detail and is illustrated by a large number of photomicrographs. There appear to be certain differences from the classical concept, particularly in the way in which tetrad formation occurs. The second part of the paper is devoted to a comparison of the structures observed in the living nuclei, examined by ordinary light and by phase contrast, with those in nuclei fixed in osmic acid and acetic acid fixatives and subsequently stained, particularly by the Feulgen reaction.

S.W.

219—Ciencia. Mexico.

- a. FLORES-BARROETA, L., 1955.—“Céstodos de vertebrados. III.” 15 (1/3), 33-38. [English summary pp. 37-38.]

(219a) *Proteocephalus hernandezi* n.sp. from *Rana* sp. in Guatemala is described and figured. The position of the vagina behind the cirrus sac would place it in the first of the ten groups proposed by Meggitt for the numerous species of *Proteocephalus*. Flores-Barroeta, however, does not consider that these groups are of much significance as the differences between them are not sufficiently precise. The new species is characterized by the position of the vagina posterior to the cirrus sac, the presence of 59-78 testes and a total of 21-32 uterine branches, the pear shape of the cirrus sac, and the triangular form of the scolex which measures 0.88 mm. in diameter, is unarmed and has four elongate suckers. In *Bertiella* (*Bertiella*) *lopez-neyrai* n.sp., from the coati *Nasua narica yucatanica* in Guatemala, there is a very large arborescent and strongly muscular genital atrium, the ovary lies in the anterior central portion of the segment with the shell gland behind it and the testes are in the posterior region of the proglottis, extending forward to the middle region and surrounding the shell gland. *Ophiotaenia nattereri* Parona, 1901 from a Mexican snake is redescribed and figured.

M.MCK.

220—Circular. North Dakota Agricultural College Extension Service.

- a. STRUM, G. & EVELETH, D. F., 1955.—“Control worms and other internal parasites of sheep.” No. A-227, 6 pp.

221—Comptes Rendus des Séances de la Société de Biologie. Paris.

- a. CHABAUD, A. G. & LARIVIÈRE, M., 1955.—“Cycle évolutif d'un ascaride: *Subulura jacchi* (Marcel 1857) parasite de primates, chez la blatte *Blaberus fuscus*.” 149 (13/14), 1416-1419.

(221a) Chabaud & Larivière describe the life-history of *Subulura jacchi* from *Hapale jacchus*. Of four species of insects fed with *S. jacchi* eggs, only *Blaberus fuscus* became infected. At about 25°C., the first fully developed and apparently infective larvae appeared after twelve days. The precise times of moults were difficult to establish. Some of the youngest larvae were able to encapsulate themselves, others remained free and the development of the latter was more rapid. Two moults occurred in the intermediary. The third-stage larva underwent a curious contraction; the body thickened and curved dorsally until the tail touched the head and the whole larva appeared subspherical. This must have taken place very rapidly as no larva was observed actually undergoing the metamorphosis. The morphology of each stage is described and illustrated.

S.W.

222—Current Science. Bangalore.

- a. HIREGAUDAR, L. S. & RAO, S. R., 1955.—“An unusual record of *Taenia* with a single circle of hooks from a dog.” [Correspondence.] **24** (6), 199.
- b. CHATTOPADHYAY, S. B. & SENGUPTA, S. K., 1955.—“Root-knot disease of jute in West Bengal.” [Correspondence.] **24** (8), 276-277.

(222a) A tapeworm collected from a dog in Bombay State had a single circle of hooks but was otherwise indistinguishable morphologically, except in body length, from *Taenia hydatigena*. R.T.L.

(222b) The authors describe the symptoms of root-knot disease of jute (*Corchorus olitorius* and *C. capsularis*) in West Bengal. The causal nematode is *Meloidogyne incognita*. M.T.F.

223—Deutsche Tierärztliche Wochenschrift.

- a. WETZEL, R. & MARHOLDT, D., 1955.—“Zur Differentialdiagnose der dritten Larven von *Chabertia ovina* und *Oesophagostomum venulosum*.” **62** (39/40), 429-430.
- b. ENIGK, K., 1955.—“Weitere Untersuchungen zur Aerosoltherapie des Lungenwurmbefalles der Wiederkäuer.” **62** (43/44), 489-493.

(223a) Wetzel & Marholdt list six points of difference between the third-stage larvae of *Chabertia ovina* and of *Oesophagostomum venulosum*. These are: (i) average body length of *C. ovina* is 100 μ shorter than *O. venulosum* (this characteristic is of little diagnostic value as the measurements of individual specimens of both species overlap); (ii) *Chabertia ovina* has its greatest breadth at the point of transition from oesophagus to intestine, while in *O. venulosum* this is at the genital anlage; (iii) the tail end of *C. ovina* is sharp and that of *O. venulosum* slightly rounded; (iv) the ratio of length of oesophagus to body length is 2:6 in *C. ovina* and 2:7 in *O. venulosum*; (v) in *C. ovina* the intestinal cells are rectangular while they are five-sided in *O. venulosum*; (vi) in 79% of *C. ovina* the genital anlage was ventral between the eighth and ninth lower intestinal cell whereas in 69% of *O. venulosum* it was ventral between the ninth and tenth lower intestinal cell. For rapid and reliable differential diagnosis (iii), (v) and (vi) are the most important characteristics. A.E.F.

(223b) Enigk has continued his studies on the use of aerosols in the treatment of lung-worm disease of ruminants. In an attempt to obviate the use of expensive apparatus, and to make it possible to treat a number of animals at once in a sealed shed, two methods of heating the anthelmintics so that they formed a smoke, or became vaporized, were tried. Both were however unsatisfactory either because a part of the drug precipitated too quickly or because of irritation of the bronchial mucous membrane. In some cases, too, the particles produced were far too large. Enigk has therefore had to fall back on the air-compressor apparatus described in his earlier paper [for abstract see Helm. Abs., **22**, No. 116a] which further experience with the treatment of 1,418 sheep and 571 cattle has shown to be satisfactory. The most suitable anthelmintic is Askaridol (Knoll) which is still more effective when san-tonin (4.5 gm. to each 100 gm. Askaridol) is added: the mixture however is not so well tolerated. The apparatus has been modified and improved: six sheep or three calves may be treated at once. For an uncomplicated primary infection one course of treatment of 15 minutes is usually sufficient but for reinfections a second may be needed after a six to ten day interval. Where broncho-pneumonia is present a bactericide should be added to the anthelmintic. A.E.F.

224—Documenta de Medicina Geographica et Tropica. Amsterdam.

- a. LIE KIAN JOE, GUPITO, C. & HANDOJO, K., 1955.—“A case of cysticercosis in Indonesia.” **7** (2), 134-135.
- b. SWELLENGREBEL, N. H., 1955.—“Wild, domestic and interhuman parasitism.” **7** (2), 182-190.

(224a) A second case of cysticerciasis is reported from Indonesia. The patient was a Chinese woman with no previous history of intestinal infection with *Taenia solium*. There were numerous cysticerci in the brain but no cysts were found in other organs. S.W.

(224b) Swellengrebel discusses a number of zoonoses, defined as parasitic and bacterial infections which man shares with certain mammals, and restricts himself to those in which the existence of the parasite as a species is independent of the human body as opposed to human activity. The main example he cites from among the helminths is that of *Echinococcus*; the natural cycle is in a flock of sheep herded by dogs and it is thus dependent on human activity in sheep farming. Swellengrebel suggests the term "domestic zoonosis" for this type. In Canada an *Echinococcus* cycle exists outside human society operating between wolves and moose. Man can become infected from either cycle but it is not yet possible to determine which of the two cycles, domestic or wild, is the primitive condition. S.W.F.

225—Down to Earth. Midland, Michigan.

- a. McGREW, J. R. & GOHEEN, A. C., 1955.—"Nematode control in strawberry plantings stocks." 10 (4), 4-5.
- b. TURNER, G. O. & DIETER, C. E., 1955.—"Factors influencing the effectiveness of ethylene dibromide as a soil fumigant." 10 (4), 12-13.

(225a) By careful propagation, starting with runner plants rooted in steam sterilized soil and propagating these in fumigated soil, stocks of strawberry varieties were built up substantially but not entirely free from nematode infestation. Complete control was obtained by means of warm-water treatment of dormant plants. Blakemore plants infested with nematodes were dug during winter and stored at 32°F.: before treatment they were pre-warmed to 100°F.-110°F. for five minutes and after treatment were immediately plunged into cold water. Treatments which killed nematodes but did not damage the plants were 121°F. for 7 minutes, 124°F. for 3.5 minutes, 127°F. for 2 minutes and 130°F. for one minute. Growth was temporarily retarded but was subsequently better than in controls. Field-grown as well as green-house-grown plants were successfully treated. [A more detailed report of the experiment was published in *Pl. Dis. Rept.*, 1954, 38, 818-826. For abstract see *Helm. Abs.*, 23, No. 479g.] M.T.F.

(225b) The authors discuss the major factors which affect the action of ethylene dibromide as a soil fumigant, viz., the pests to be controlled, the type and texture of the soil, its temperature and moisture, previous crops and crop residues, preparation of the soil, application of the fumigant, sealing of the soil and subsequent aeration and fertilization in relation to the crop which is to follow. M.T.F.

226—East African Agricultural Journal.

- a. TROUGHT, T.E.T., 1955.—"Preliminary tobacco eelworm investigations in Uganda." 21 (1), 28-31.

(226a) A survey of the tobacco growing areas showed that *Meloidogyne* spp. were present everywhere. Soil injection experiments with D-D mixture, 6 c.c. to 9 in. deep at 12 in. intervals on seed-bed and field sites, showed the significant value of seed-bed treatment in the reduction of eelworm infestation and increased green leaf yields. Seed-bed treatment under peasant supervision was considered to be impracticable. J.B.G.

227—Ergebnisse der Wissenschaftlichen Untersuchung des Schweizerischen Nationalparks.

- a. ALTHERR, E., 1955.—"Les nématodes du Parc National Suisse. (Nématodes libres du sol.) 3e partie." 4 (32), 319-328.

(227a) Altherr lists the nematodes found in seven soil samples and discusses the relationships of several species (mostly *Dorylaimus*) which could not be identified exactly. Of 57 species in the samples, none are new and only ten are new records for the Parc National Suisse. He concludes that most of the species there have now been found. M.T.F.

228—Euphytica. Wageningen.

- a. HUIJSMAN, C. A., 1955.—“Breeding for resistance to the potato root eelworm. II. Data on the inheritance of resistance in *andigenum-tuberosum* crosses obtained in 1954.” 4 (2), 133-140. [Dutch summary pp. 139-140.]

(228a) Huijsman reports on data obtained during 1954 on the inheritance of resistance to *Heterodera rostochiensis*. They support the theory that each of the *Solanum andigenum* clones C.P.C.1673 and 1685 is governed by one dominant gene with a major effect in a tetraploid scheme, although it is not yet known whether these genes are identical. Amongst F_1 seedlings of *S. andigenum* \times *S. tuberosum*, selected for commercial characters, the percentage of resistant seedlings was the same as in the random material from which they were selected.

J.B.G.

229—Experimental Parasitology. New York.

- a. EGERTON, J. R. & HANSEN, M. F., 1955.—“Immunity and tolerance of chickens to the roundworm, *Ascaridia galli* (Schrank).” 4 (4), 335-350.
- b. GOODCHILD, C. G., 1955.—“Transplantation of gorgoderine trematodes into challenging habitats.” 4 (4), 351-360.
- c. KAGAN, I. G., 1955.—“Studies on the serology of schistosomiasis. I. The *in vitro* activity of cercariae and miracidia in serum of experimental, natural, and immunized hosts.” 4 (4), 361-376.
- d. EVANS, A. S., STIREWALT, M. A. & MACKENZIE, M., 1955.—“Serologic reactions in *Schistosoma mansoni* infections. II. Cercarial behavior in electrophoretically separated fractions of sera of infected and uninfected mice.” 4 (5), 419-426.
- e. HUNTER, W. S. & VERNBERG, W. B., 1955.—“Studies on oxygen consumption in digenetic trematodes. II. Effects of two extremes in oxygen tension.” 4 (5), 427-434.
- f. STONER, R. D. & HANKES, L. V., 1955.—“Incorporation of C^{14} -labeled amino acids by *Trichinella spiralis* larvae.” 4 (5), 435-444.
- g. DAUGHERTY, J. W., 1955.—“Intermediary protein metabolism in helminths. III. The L-amino acid oxidases in *Hymenolepis diminuta* and some effects of changes in host physiology.” 4 (5), 455-463.
- h. BAKER, N. F., 1955.—“The pathogenesis of trichostrongyloid parasites: some effects of *Nematostrioides dubius* on the erythrocyte patterns and spleens of mice.” 4 (6), 526-541.

(229a) Egerton & Hansen determined the effect of injecting serum from chickens infected with *Ascaridia galli* into fowls, before infecting them with the parasite. About 100 ova containing viable larvae of *A. galli* were fed to each of 89 two-week-old chicks and serum was obtained from them three weeks later. This was injected intraperitoneally into a further 87 two-week-old chickens at the rate of 2 c.c. per bird; each bird was then given 100 infective eggs. Another group of 83 received normal serum from 89 unparasitized birds and was similarly infected. The gains in weight and increases in body length were recorded as averages for each of the four groups up to the fifth week of age when the chicks were killed. The chickens injected with “immune” serum harboured more worms than any others, with an average of 10.95 each as compared with 7.44 in those given normal serum and 6.03 in the parasitized group supplying serum. Whereas this last group gained only an average of 235.55 gm. each, the average weight gains made by both injected batches were in the region of 252 gm., i.e. about the same as the normal, unparasitized birds. The chickens given “immune” serum, therefore, made the highest weight gains in spite of carrying the heaviest infections. M.MCK.

(229b) *Gorgodera amplicava* from *Rana catesbeiana* and *Gorgoderina attenuata* from *R. pipiens* were found dead or moribund 18-48 hours after transplantation from the host bladders to the recta of normal frogs, or when transplanted into cleansed recta after the latter had been surgically severed from the ilea, or into intestinal fistulae surgically opened to the outside. Specimens were placed in frog recta which had been opened to the flank at their anterior ends. They were regularly flushed with artificial frog-bladder urine and appeared normal for two days after implantation, surviving a maximum of four days. When transplanted into the true urinary bladder of female turtles (*Chrysemys picta picta*), normal flukes were recovered after seven to ten days from the bladder stalk or the epithelium adjacent to it. They did not survive deeper in the bladder and none were recovered 24 hours after 38 specimens

had been placed in the accessory urinary bladder. In newts (*Triturus viridescens viridescens*) flukes were healthy after an intravesical existence of 24 and 48 hours. Much longer survival in bladders of turtles and newts, which are resistant to infection with these species of flukes, is considered possible.

M.MCKE

(229c) Kagan studied the *in vitro* response of cercariae and miracidia of *Schistosoma mansoni* and *Schistosomatum douthitti* in immune serum from experimentally infected monkeys, human serum from naturally infected persons and rabbit serum after immunization with antigens prepared from stages in the life-cycle of *Schistosoma mansoni* and *Schistosomatum douthitti*. Positive "Cercarienhiillenreaktion" (CHR) tests were observed with antisera against miracidia, infected snail livers, cercariae, immature adults and adult stages of *Schistosoma mansoni* and male worms, infected snail livers and miracidia of *Schistosomatum douthitti*. Mouse spleens containing eggs of *S. douthitti* used as antigens were negative. The antibody was found to be fairly stable and sera were not inactivated after storage but heating the serum at 56°C. was found to diminish the CHR reaction. With *Schistosoma mansoni* the CHR was detected as early as 10 days after exposure in the rabbit, 20 days in the hamster, 34 days in the guinea-pig, 40 days in the rat and 52 days in the mouse. In monkeys exposed to *Schistosomatum douthitti* the CHR was detected in sera 15 days after exposure. The CHR of a serum from a patient infected with *Schistosoma haematobium* was better with cercariae of *S. mansoni* than cercariae of *Schistosomatum douthitti*. The CHR activity of a serum could be absorbed with living cercariae or a cercarial homogenate that had been heated at 94°C. for 30 minutes. The miracidial immobilization test was more sensitive than the CHR in the detection of antibody in infected animals or animals immunized with schistosome antigens, sera that were negative for CHR often showing titres with miracidia. It was found that normal vertebrate sera contain non-specific miracidicidal substances that, with one exception (the horse), are destroyed or weakened by heating at 56°C. for 30 minutes.

D.L.H.J

(229d) Evans, Stirewalt & MacKenzie isolated electrophoretically fractions of serum from both uninfected mice and mice infected with *Schistosoma mansoni*. Cercarial behaviour was observed in eight globulin samples. The first and second samples below the epsilon boundary were effectively cercaricidal in both uninfected and infected mouse serum. Successive samples through the fifth were progressively less so. Beyond the fifth, no lethal activity was observed. Pericercarial envelopes were formed only in the third, fourth and fifth samples of infected mouse serum. It was concluded from these findings that the first or "gamma" sample of infected mouse serum contained the factors responsible for both cercaricidal activity and pericercarial envelope formation and that the third or "alpha" sample introduced a cercaricidal inhibitor which thus made it possible for the cercariae to form envelopes. Envelopes were found therefore only in those infected serum samples which contained both gamma and alpha globulins or serum components with similar mobilities.

D.L.H.RS

(229e) Hunter & Vernberg examined the oxygen uptake of *Gynaecotyla adunca* in 5%, 21% and 100% oxygen. The adults showed a maximum uptake in 21% oxygen whereas respiration of the cercariae was relatively independent of oxygen tension. Under anaerobic conditions the adults survived for 24 hours; the cercariae died after 12 hours.

W.P.R.

(229f) Stoner & Hankes fed C^{14} -labelled amino-acids for periods of six or seven days to rats which had been infected with *Trichinella spiralis* for 14, 56 and 180 days. Larvae isolated from rats which had been fed glycine-2- C^{14} and *dl*-alanine-2- C^{14} for 14 to 21 or 56 to 61 days after infection showed a higher specific activity than the host muscle protein. Encysted larvae (180 days after infection) took up significant amounts of C^{14} when the hosts were fed glycine-1- C^{14} and *dl*-alanine-1- C^{14} . The presence of encysted larvae (56 and 180 days after infection) did not alter the incorporation of C^{14} activity into host muscle protein.

W.P.R.

(229g) Daugherty examined the activity of a number of amino-acid oxidases in cell-free homogenates of *Hymenolepis diminuta* from mature male rats. Under appropriate conditions L-glutamic dehydrogenase showed activity of 2.47–2.93 μ l. oxygen per hour, per mg. dry weight. Castration of the host, complete depletion of protein from the diet and adrenalectomy had no significant effect on the activity of the enzyme in the parasites, but high protein diets led to increased activity. Seven other amino-acid oxidases were examined but the results obtained were extremely variable and the author concludes that of the eight substrates used, glutamic acid alone is effectively oxidized by *H. diminuta*. W.P.R.

(229h) Baker studied the changes in the erythrocyte patterns following the infection of 50 mice of the Webster strain with larvae of *Nematospiroides dubius*. The infections, accomplished by feeding 30-day-old mice with 400 or 800 larvae and repeating the dose after 21 days, caused prominent splenomegaly. After the excystment of the larvae from the gut wall the erythrocyte counts and haemoglobin levels markedly decreased. The anaemia changed from hypocythaemic, microcytic and hyperchromic in the early stages of infection to one characterized by hypercythaemia, microcytosis and hypochromia in the later stages. No haemoglobin anaemia occurred in mice given supplementary iron. In both splenectomized and normal mice worms developed in roughly equal numbers and about as many splenectomized as normal mice died as a result of the heaviest infections, showing that the spleen did not increase resistance. The spleen was considerably enlarged in ten mice injected intraperitoneally or subcutaneously with 400 infective larvae. These larvae encysted and grew a little but did not apparently ingest blood; splenomegaly must have resulted from some factor other than haemorrhage or anaemia. M.MCK.

230—Farmer and Stock-Breeder.

- a. DUNNETT, A., 1955.—“Eelworm-free seed potatoes. New process developed in Scotland to meet export demands.” 69 (3407), 51, 53.

(230a) Dunnett describes a machine which washes seed potatoes completely free from soil and eelworm cysts and controls five common fungal diseases. The potatoes are treated within 48 hours of lifting. They are graded and the seed-sized tubers are washed, after thorough saturation, under jets of water at a pressure of 70 lb. per square inch. They then pass through a trough containing “a special mercury solution” where they remain for 15 minutes. A second jet-washer, at lower pressure, removes the mercury and the tubers are partly dried by sponge-rubber rollers and stacked in sprouting trays to harden off and green. Two to three tons of seed an hour can be treated. M.T.F.

231—Folia Biologica. Prague.

- a. RYŠAVÝ, B., MICHÁLEK, J. & FIDLER, V., 1955.—[Zur Frage der Möglichkeit einer Adaption des in Gänsen parasitierenden Wurmes *Amidostomum anseris* (Zeder, 1800), Railliet und Henry, 1909 an Wirtsvögel anderer Ordnungen.] 1 (5), 276–281. [In Russian: German summary pp. 280–281.]
- b. ROSICKÝ, B. & RYŠAVÝ, B., 1955.—[Ekologische Bedeutung des Strauches für die Erhaltung des Massenvorkommens einiger Parasiten auf Weidegründen.] 1 (6), 327–338. [In Russian: German summary pp. 337–338.]

(231a) *Amidostomum* is reported from a terrestrial bird for the first time. *A. anseris* was found in four of 26 *Streptopelia decaocto* near a goose-fattening farm in the Prague area. The worms were identical with those found in geese, but were restricted to a portion of the gizzard only and lay free between the horny lining and the muscular wall. This case shows that *A. anseris* is adaptable and that wild birds can become reservoir hosts for some parasites of poultry. G.I.P.

(231b) Shrubs on untended pastures create very favourable conditions for the existence of some parasites, including *Muellerius capillaris*, and snails. From the point of view of human health and animal farming they are therefore highly undesirable, particularly on low-lying pastures. G.I.P.

232—Gartneryrket.

- a. FJELDDALEN, J., 1955.—“ Stengelål på hortensia.” 45 (1), 4-5.

(232a) *Dirylenchus dipsaci* has been found in *Hydrangea opuloides* in Norway. The symptoms are described. Some differences in susceptibility between different varieties seem to exist. Systox seems to give some control. S.B.

233—Gastroenterology. Baltimore.

- a. DEGOUVEIA, O. F. & BEAMER, W. D., 1955.—“ The importance of microscopic granulomas (pseudotubercles) in the diagnosis of Manson's schistosomiasis.” 28 (4), 634-641.

(233a) Of 62 patients, previously resident in areas endemic for *Schistosoma mansoni*, who were examined by rectal biopsy 23 were found to be infected. The biopsies of 13 out of the 23 showed granulomata, most of which contained eggs or recognizable remnants of eggs; in four granulomata were the only diagnostic finding. The authors are of the opinion that, even when eggs are not found, the finding of granulomata may be significant in the diagnosis of this infection and should be followed up by further careful investigation. S.W.

234—Grower. London.

- a. DUDDINGTON, C. L., 1955.—“ Can we develop fungi to kill eelworm ? ” 43 (20), 1203, 1205.
b. SMALL, T., 1955.—“ Report from Jersey. 3. Island's battle against potato root eelworm.” 43 (22), 1309, 1311, 1313.

(234a) This popular article deals in a general manner with the way in which various predacious fungi capture nematodes. J.B.G.

(234b) *Heterodera rostochiensis* is wide-spread in Jersey, particularly in the coastal areas where early potatoes are followed by tomatoes and there is no crop rotation. Early potatoes usually do reasonably well but the tomatoes are often a complete failure. D-D mixture applied at 45 gal. per acre has proved profitable where the disease is severe. Taint has been produced in potatoes, although not in tomatoes, and an official permit is required before this chemical may be used. M.T.F.

235—Harefuah.

- a. WITENBERG, G. & SALITERNIK, Z., 1955.—[Danger of schistosomiasis in Israel.] 48 (10), 219-220. [In Hebrew: English & French summaries p. 220.]

(235a) Witenberg & Saliternik found that although *Bulinus* is wide-spread in Israel and *Planorbis* is confined to a small section of the River Yarkon, carriers of *Schistosoma haematobium* are rare compared with those of *S. mansoni*, who are mainly immigrants from the Yemen. The discovery of *S. haematobium* in 50% of the young people in Tirat-Zvi is a warning against complacency at the disappearance of old foci. M.M.C.K.

236—Hassadeh.

- a. SHAMIR, H. & BECKER, D., 1955.—[About the parasite injurious to sheep and cattle.] 35 (9), 747-748. [In Hebrew.]

237—Hemera Zoa. Buitenzorg.

- a. MIMIOGLU, M. & HOLZ, J., 1955.—“Experimentelle Untersuchungen über die Wirkung von ‘Distomosan’ auf die Leberegel von Rind und Schaf.” 62 (1/8), 68–71.

(237a) Mimioglu & Holz have successfully used Distomosan (effective components hexachlorethane and tetrachlorethylene) against liver-fluke in sheep and cattle. Sheep were given 1 c.c. per 5 kg. body-weight of the substance in liquid form mixed with flour and water, while cattle received capsules (one capsule containing 15 gm. Distomosan per 100 kg. body-weight). This treatment was effective against both large and small liver-flukes. It is suggested that capsules should be used for sheep in order to avoid certain difficulties in administration.

A.E.F.

238—Heredity. London.

- a. HOWARD, H. W., 1955.—“Breeding potatoes for resistance to root eelworm (*Heterodera rostochiensis*).” [Abstract of paper presented at 116th Meeting of the Genetical Society of Great Britain, London, November 20, 1954.] 9 (1), 150.

(238a) The resistance to potato root eelworm shown by some lines of *Solanum tuberosum andigenum* behaves as a dominant character when these plants are crossed with *S. tuberosum tuberosum*. Root diffusate is produced by these plants and larvae invade the roots but do not develop to maturity. The *andigenum* lines are short day types and the character of resistance has to be combined with the long day adaptation of the standard varieties.

J.B.G.

239—Higiiena i Sanitariya. Moscow.

- a. SLEPUSHKINA, I. I., 1955.—[Utilization of the helminthological method of examination of soil in cities.] Year 1955, No. 4, pp. 17–20. [In Russian.]
 b. PURINA, E. A., 1955.—[Result of sanitary educational work in the prevention of helminthiasis in children.] Year 1955, No. 4, pp. 36–39. [In Russian.]

(239a) Only 37.7% of the soil samples examined from various parts of a town in southern Russia were free from helminth ova. 1 kg. of soil from parks contained an average of 6 eggs, from areas of the town with sanitation an average of 28 eggs, and from densely built up areas without sanitation 386 to 1,509 eggs. *Ascaris* comprised 60% to 100% of the eggs in the soil samples and *Trichuris* 3.3% to 40%.

G.I.P.

(239b) The three most senior classes in a Moscow school were taught the pathology and control of helminth infections in man and all children and parents received general instruction in subjects including hygiene. This resulted in a great increase in the number of schoolchildren attending for faecal examination and treatment.

G.I.P.

240—Indian Journal of Child Health.

- a. MODI, C. J. & DAVE, C. V., 1955.—“Incidence of threadworm (*Enterobius vermicularis*) infestation in school children in Ahmedabad.” 4 (4), 205–207.

241—Indian Journal of Malariology.

- a. KRISHNASWAMI, A. K., 1955.—“Filariasis in Mangalore (South India).” 9 (1), 1–16.

(241a) In Mangalore 7,402 persons, constituting 6.3% of the population, were examined in March and April of 1954 for microfilariae in the night blood. *Wuchereria bancrofti* was the only species found and was present in 15%. External manifestations of disease occurred in 9.5% and were nearly always elephantiasis of the arms or legs. The disease was prevalent throughout Mangalore and appears to have spread from the coastal districts. 3,646 female anophelines and culicines were collected during the survey and were dissected. Microfilariae were found only in *Culex fatigans* and of 3,387 which were dissected, 13.9% showed infection. The types of breeding places of *C. fatigans* in Mangalore are enumerated and discussed and a table is given of unpublished records showing the disease and microfilaria rates in the town's population during the years 1950–53.

M.MCK.

242—Indian Journal of Veterinary Science and Animal Husbandry.

- a. PETER, C. T., 1955.—“Studies on the cercarial fauna in Madras. I. The furcocercous cercariae.” **25** (2), 121–127.
- b. PETER, C. T., 1955.—“Studies on the cercarial fauna in Madras. II. A new species of echinostome cercaria.” **25** (3), 219–224.
- c. TANDON, R. S., 1955.—“A redescription of *Paramphistomum gotoi* Fukui, an Indian record of the species.” **25** (3), 225–233.

(242a) An investigation into the incidence of cercarial infection in fresh-water snails in the city of Madras revealed the occurrence of nine species of furcocercous cercariae in four species of snails. The percentages of infection are tabulated. The highest recorded was 6.1% for *Vivipara bengalensis* which contained only one kind of cercaria and this belonged to the *vivax* group of Sewell. This constitutes the first record of a furcocercous cercaria in *V. bengalensis*. *Cercariae indica* II and two unidentified forms, one closely resembling *Cercaria bombayensis* No. 8 and the one belonging to the *vivax* group, were reported from Madras for the first time. *Cercaria mudaliari* n.sp. from *Limnaea luteola* f. *succinea* is illustrated and described. It closely resembles *C. douglasi* and the cercaria of *Cotylurus flabelliformis* but differs mainly in that there are 17 stumpy spines in the mouth of the new species instead of 16 to 20 elongate ones; ten bristles are present on the body instead of two, and there are ten bristles on each side of the tail stem arranged in pairs, as compared with an indefinite number irregularly arranged on the other two species. Typical caudal glands are present (eight cells on each side of the caudal excretory vessel) and the eyespots are pale yellow.

M.MCK.

(242b) Peter describes and illustrates *Cercaria nairi* n.sp., the first echinostome to be found developing in *Indoplanorbis exustus* in Madras City. *C. nairi* belongs to the *echinatoides* group and most closely resembles *Cercariae indicae* xlvii but may be distinguished from it by the arrangement of the rod-like bodies in bundles in the cystogenous glands, by the presence of two irregularly conical bodies, filled with refractile granules, on the dorsal surface near the posterior edge of the oral sucker, by the number and arrangement of the collar spines and by the presence of 15 pairs of flame cells. The cercaria of *Echinostoma revolutum*, found in *Limnaea luteola* f. *succinea*, is recorded for the first time in India.

S.W.

(242c) Tandon presents a detailed redescription of *Paramphistomum gotoi* from the rumen of *Bubalus bubalis* in Lucknow and compares his observations with those of Fukui and of Dawes. He confirms the presence of papillae and spines on the oral sucker, that the intestinal caeca are wavy, stout and dilated, and inturned at the ends and that Laurer's canal opens in front of the excretory pore. The eggs are described for the first time; they are oval, operculate and measure 0.1085–0.1209 mm. × 0.0684–0.0744 mm.

S.W.

243—Indian Veterinary Journal.

- a. DAS, K. M., 1955.—“Occurrence of microfilariae of *Stephanofilaria as[s]amensis* in the peripheral blood of cattle.” **32** (2), 136–137.
- b. PAI, K. N., 1955.—“Incidence, symptoms and treatment of ‘ascariasis’ among calves in Puttur, South Kanara district.” **32** (2), 143–145.
- c. PATRA, B. N. & MURTY, B. K., 1955.—“Nasal granuloma in cattle—some observations from a mass treatment undertaken at Balimi, Orissa.” **32** (2), 148–150.
- d. VASUDEV, T., 1955.—“Occurrence of *Setaria cervi* in the liver of cattle.” **32** (3), 233.

(243a) Of 4,058 cattle affected with humpsore in Orissa, India, 399 showed microfilariae of *Stephanofilaria assamensis* in blood smears. This is the first record of these microfilariae being found in the peripheral blood. They did not appear to show any periodicity.

M.MCK.

(243b) Faecal examination of the calves under six months of age brought to the veterinary hospital at Puttur, South Kanara, India, showed ascarid eggs in 11 (6.3%) of the white cattle and in 33 (37.9%) of the buffaloes. A mixture (of which the prescription is given) containing tetrachlorethylene or carbon tetrachloride and administered with chenopodium oil in the first dose and subsequently alone proved a good anthelmintic.

M.MCK.

(243c) In the Dhenkannal district of Orissa, cattle were treated for nasal granuloma with intravenous injections of sodium antimony tartrate at the rate of 1.5 gm. per 100 lb. body-weight given in a 4% aqueous solution. An animal of average size (400-500 lb.) received four injections during two consecutive weeks, the first of 10 c.c., the second of 15 c.c. and the third and fourth each of 20 c.c. Out of 1,570 animals in the district 231 had nasal granuloma and were treated. Altogether 165 were cured in the first course of treatment and did not develop the disease the following year. The best times of year for treatment are during the rains and in winter. This is a cheaper method of control than snail eradication and more popular among villagers. M.MCK.

(243d) Vasudev reports an atypical occurrence of *Setaria cervi*; one entire worm was found in the liver of an ox in a Secunderabad slaughterhouse. G.I.P.

244—Japanese Journal of Medical Science and Biology.

- a. ITO, J., 1955.—“Studies on the host-parasite relationships of *Schistosoma japonicum* in common laboratory animals.” 8 (1), 43-62.
- b. SAWADA, I., 1955.—“On the original terminal segment of *Railletina* (*Paroniella*) *kashiwarensis*.” 8 (1), 77-79.

(244a) From a series of experimental infections Ito has shown that rabbits are more suitable hosts for *Schistosoma japonicum* than are guinea-pigs, albino rats or albino mice. He describes the histopathological changes observed in the liver, intestines, lungs, heart, kidneys and spleen of each host animal. Similar lesions developed in rabbits and mice but the mice lost the infection after 30 weeks. The infection rate was lower in guinea-pigs but the histopathological changes appeared unexpectedly mild. Rats showed the lowest infection rate and lost the infection after 16 weeks, most of the schistosomes being trapped and killed in the liver. S.W.

(244b) Following the observation made by Luttermoser in 1938 [in *J. Parasit.*, 24, Suppl. pp. 14-15] that the original terminal segment of a tapeworm has a characteristic structure differentiating it from other proglottides, Sawada has studied *Railletina* (*Paroniella*) *kashiwarensis*. Chicks were infected with cysticercoids, killed 15 days later and dissected; the original terminal segment had already separated from some of the cestodes, together with the four or five proglottides immediately preceding it. The original terminal segments had rounded ends and were longer than the other proglottides. S.W.

245—Journal of the American Veterinary Medical Association.

- a. SMITH, H. M. S., 1955.—“Toluene therapy for ascariasis and bot infestations in horses.” 127 (942), 245-246.
- b. KELLEY, G. W., 1955.—“The effect of roughage on the number of eggs of *Haemonchus contortus* per gram of feces from experimentally infected calves.” 127 (944), 449-450.
- c. JENSEN, R. & SEGHEITTI, L., 1955.—“Elaeophorosis in sheep.” 127 (945), 499-505.
- d. SCHLOTTHAUER, C. F. & ZOLLMAN, P. E., 1955.—“The occurrence of *Rhabditis strongyloides* in association with dermatitis in a dog.” 127 (945), 510-511.
- e. LEVINE, N. D. & MORRILL, C. C., 1955.—“Bovine stephanofilariasis dermatitis in Illinois.” 127 (945), 528-530.

(245a) Smith considers toluene to be superior to other anthelmintics in the treatment of ascarids in horses. A programme of worm control using this drug will gradually lead to the complete eradication of ascarids on a farm. The dose of toluene recommended is 0.2 c.c. per lb. body-weight given by stomach tube; the first dose is given to foals when 12 weeks old and the second when 6 months old, i.e. after weaning. This is followed by periodic doses in yearlings commencing a month after the first frost when all horses are also treated for bots. Out of 454 horses treated with toluene only one showed any toxic reaction and recovered in two hours. D.M.

(245b) Studies on helminthiasis are usually based on the numbers of eggs per gramme of faeces and it is therefore important to understand as fully as possible the factors affecting

egg counts. Experiments were made on two groups of calves experimentally infected with *Haemonchus contortus*. The first group was fed on a ration with a high roughage content for eleven days followed by a ration with a low roughage content for eight days. With the second group this procedure was reversed. The egg counts were inversely proportional to the amount of roughage fed and the amount of faeces excreted, although the total number of eggs produced daily was not influenced by the amount of roughage in the ration. The rations of cattle should therefore be considered when estimating the degree of parasitism from the number of eggs per gramme of faeces. D.M.

(245c) Microfilarial lesions in the skin of the head and feet, and in the mucous membranes of the eyes, mouth and nasal cavities of 18 range ewes, were found associated with adult *Elaeophora schneideri* which were located in the arteries supplying the affected tissues. Although adult *E. schneideri* were widely distributed in the arterial system microfilarial lesions were found only in the membranes exposed to an external environment and were usually unilateral. Thrombosis caused by the worms was seen once in the sphenopalatine artery. D.M.

(245d) Larvae of *Rhabditis strongyloides* were found associated with a severe dermatitis in a 10-month-old Pointer dog. By treating the infected areas with a 2% solution of chlordane the larvae were killed and the lesions disappeared in about two months. D.M.

(245e) An area of chronic dermatitis on the abdominal mid-line in front of the udder of a yearling heifer was found to be associated with *Stephanofilaria stilesi*. At the bases of some of the hair follicles cysts were found containing nematodes with coiled larvae in their uteri. Larvae were also found outside the cyst, suggesting that the larvae pass through the cyst wall and migrate towards the surface of the skin. The life-cycle is unknown. D.M.

246—Journal of the British Grassland Society.

- a. SPEDDING, C. R. W., 1955.—"The effect of a sub-clinical worm-burden on the productivity of sheep." 10 (1), 35-43.

(246a) Spedding has investigated the possibility of raising worm-free lambs from infected ewes under grazing conditions and has compared the productivity of these lambs with that of a similar group with a subclinical infection. By folding the lambs and ewes after every two days' grazing, lambs were kept free from the important nematodes and the faeces showed only very small numbers of *Strongyloides papillosus* and *Trichuris ovis* ova; *Nematodirus* ova were absent. Immediately after weaning a few ova appeared in the faeces of lambs which had previously been negative. The differences between these observations and those made on housed animals are discussed. There was a significant difference in weight gain between the uninfected or very lightly infected lambs and those with subclinical infections although the experiment lasted only two months. An estimate is made of the depression in productivity caused by subclinical infections, including reduction in weight gains and the effect on carcass quality and wool production. S.W.

247—Journal of the Egyptian Medical Association.

- a. GHALIOUNGUI, P., WAHBA, N., TEWFIK, F., SALAMA, E. & DEMERDASH, M., 1955.—"Studies in steroid metabolism in bilharzial cirrhosis of the liver and infective hepatitis." 38 (1), 23-46.
- b. HALAWANI, A., ABDALLAH, A. & SAIF, M., 1955.—"Miracil D in schistosomiasis. A new scheme of treatment." 38 (1), 49-62.
- c. GHEITA, A., 1955.—"A surgical conception of sigmoid bilharziasis." 38 (2), 102-109.
- d. NAIM, M. M., 1955.—"A study of spatial vectorcardiography in bilharzial cor pulmonale." 38 (2), 110-124.
- e. ELWI, A. M. & EL-TIRAEI, I., 1955.—"Appendiceal oxyuriasis. A pathological study." 38 (2), 125-134.

(247b) Halawani, Abdallah & Saif used miracil-D for the treatment of schistosomiasis, administered in sugar-coated tablets each containing 200 mg. of miracil-D hydrochloride

and 0.1 mg. of belladonna alkaloids. Tixantone tablets were also used, each tablet being chocolate-coated and containing 250 mg. miracil-D without belladonna. Eleven cases of *Schistosoma haematobium* were given 400 mg. miracil-D daily for twenty days (7.2 mg. to 12.5 mg. per kg. body-weight daily). Five cases became negative within 12 to 15 days after cessation of treatment, one did not attend for follow-up, and three showed a marked and two a slight decrease in egg count. Two patients complained of occasional nausea and vomiting. Of two series of eight patients to which 250 mg. of Tixantone were administered twice daily for 20 days and who were followed up, all except one in each series became negative within two months after treatment. Slight nausea was experienced by one patient. Of 15 patients in hospital, 12 completed a course of 600 mg. miracil-D and belladonna daily for twenty days. Eight were negative within 33 days after treatment and in the other four cases a very marked drop in egg count was observed. Occasional giddiness, anorexia, nausea and vomiting were experienced by three patients. Six out of ten cases of *S. mansoni* who completed a course of 600 mg. [the authors do not mention whether miracil-D with belladonna, or Tixantone was administered to these] daily for twenty days were found to be negative on repeated examinations. Those who did not complete the course suffered from the following manifestations: marked sweating, blurred vision, tachycardia, chronic bronchitis, emphysema, anorexia, nausea, vomiting and giddiness. The authors recommend 10 mg. per kg. body-weight daily for 18-20 days as the minimum effective dosage.

D.L.H.R.

248—Journal of Helminthology.

- a. WILLMOTT, S. & PESTER, F. R. N., 1955.—“The discovery of *Paramphistomum hiberniae* Willmott, 1950 and its intermediate host in the Channel Islands.” 29 (1/2), 1-2.
- b. WALLACE, H. R., 1955.—“Factors influencing the emergence of larvae from cysts of the beet eelworm, *Heterodera schachtii* Schmidt.” 29 (1/2), 3-16.
- c. SOLIMAN, K. N., 1955.—“Observations on some helminth parasites from ducks in southern England.” 29 (1/2), 17-26.
- d. GHARIB, H. M., 1955.—“Some observations on the transmission of bacteria by infective larvae of *Nippostrongylus brasiliensis*.” 29 (1/2), 27-32.
- e. GHARIB, H. M., 1955.—“Observations on skin penetration by the infective larva of *Nippostrongylus brasiliensis*.” 29 (1/2), 33-36.
- f. YEH, L. S., 1955.—“A new tapeworm, *Diphyllbothrium salvelini* sp. nov., from a salmon, *Salvelinus alpinus*, in Greenland.” 29 (1/2), 37-43.
- g. YEH, L. S., 1955.—“A new bursate nematode *Hepatojarakus malayae* gen. et. sp. nov. from the liver of *Rattus rattus jarak* (Bonhote) on Pulau Jarak, Straits of Malacca.” 29 (1/2), 44-48.
- h. WINSLOW, R. D., 1955.—“A new method for the production and recovery of cysts of root eelworms (*Heterodera* spp.) for use in bio-assay.” 29 (1/2), 49-54.
- i. MCCLELLAND, W. F. J., 1955.—“*Nematobothrium labeonis* n. sp., a member of the family Didymozoidae (Trematoda) from a freshwater fish.” 29 (1/2), 55-64.
- j. FRANKLIN, M. T., 1955.—“A redescription of *Aphelenchoides parietinus* (Bastian, 1865) Steiner, 1932.” 29 (1/2), 65-76.
- k. ELLENBY, C., 1955.—“On a technique for infecting plants with the potato root-eelworm, *Heterodera rostochiensis* Wollenweber.” 29 (1/2), 77-80.
- l. PETERS, B. G., 1955.—“The combined use of nematocidal soil fumigants and solubilized chemicals.” 29 (1/2), 81-86.
- m. SCHUURMANS STEKHOVEN, Jr., J. H. & MAWSON, P. M., 1955.—“On some free-living marine nematodes from Kerguelen Island.” 29 (1/2), 87-104.

(248a) Willmott & Pester record finding *Planorbis leucostoma* in the Channel Islands naturally infected with cercariae believed to be those of *Paramphistomum hiberniae*. S.W.

(248b) Wallace finds that hatching of larvae from cysts of *Heterodera schachtii* in laboratory experiments is greater at a constant temperature of 25°C. than at higher or lower temperatures. In a series of experiments where the temperature was held at either 24°C. or 15°C. for different periods during each 24 hours, greatest hatch occurred when the periods were eight hours at 24°C. and 16 hours at 15°C. for five days a week and 15°C. for the other two days. In experiments on the effect of oxygen on hatching it is shown that (i) rate of hatching increases as oxygen concentration increases, (ii) exposure of cysts to a low oxygen concentration for short periods before hatching results in reduced hatching and (iii) when

oxygen concentration fluctuates the rate of hatching is reduced. When soaked cysts were exposed to air at various saturation deficiency levels it was found that they behaved like colloid systems in that, as the saturation deficiency increased, the rate of water loss decreased. Rate of hatching from cysts so treated showed that small increases in saturation deficiency resulted in greatly reduced hatch. Experiments to determine the relationship between the moisture characteristic of a soil and the rate of hatch of *H. schachtii* in three soils of known particle size, show that the pressure deficiency necessary for maximum hatch decreases as the particle size increases. It appears that in hatching experiments conducted in watch-glasses oxygen is a limiting factor, since very much greater hatches were obtained when cysts, sand and water in sintered-glass funnels were held at the pressure deficiency which had proved optimum for larval emergence in medium, as compared with the hatch in beet diffusate in a watch-glass.

M.T.F.

(248c) Soliman found four trematode species, five cestodes, three nematodes and one acanthocephalan in 18 ducks examined on a farm in England. All the ducks were alive when collected and, with the exception of one young duckling, appeared to be active and healthy. *Hymenolepis collaris*, *Trichostrongylus tenuis* and *Filicollis anatis* are recorded from the domestic duck in Britain for the first time and *H. anatina* and *H. abortiva* have not been found in England previously. *Bilharziella* was completely absent. The pond to which the ducks had access was frequented by a number of wild birds and the possibility of their introducing infections is discussed: a number of potential intermediaries were present in the pond including *Limnaea stagnalis*, *L. pereger*, *Helicella* spp., *Asellus aquaticus* and *Daphnia pulex*; *Erpobdella octoculata* and *Theromyzon tessulatum* were also found and *E. octoculata* had cysticercoids of *Hymenolepis parvula* and cysts of a strigeid trematode, probably *Cotylurus cornutus*, in the mesenchyme. Larvae of *Filicollis anatis* were found in *Asellus aquaticus*.

S.W.

(248d) Gharib found that six types of micro-organisms were associated with cultures of *Nippostrongylus brasiliensis* and were found either within or adhering to the infective larvae. To investigate the possibility of the nematode larvae introducing bacteria into animals a number of rats and mice, known to be free of *N. brasiliensis*, were divided into three groups. In the first group infective larvae only were applied to the skin, in the second a bacterial emulsion only (*Staphylococcus aureus* or *Streptococcus pyogenes*), and in the third infective larvae and a bacterial emulsion were applied. In none of the animals of the second group were micro-organisms recovered from the subcutaneous tissue; in those of the first group gram-negative bacilli and, in some cases, streptococci were recovered; in the third group *Staphylococcus aureus* or *Streptococcus pyogenes* were recovered from all but one of the animals. Gharib concludes that skin-penetrating larvae can introduce pathogenic bacteria.

S.W.

(248e) Gharib exposed mice to larvae of *Nippostrongylus brasiliensis* for periods of from five minutes to three hours, killed them 48 hours later and examined the lymph glands draining the site of exposure, and the lungs for the presence of larvae. The lymph glands were positive in those exposed for five minutes and 20 minutes (although the larvae were dead) and the lungs were positive in those exposed for ten minutes, 30 minutes and one, two and three hours. Larvae observed penetrating the skin were seen to crawl about and then attach themselves within a few minutes of being placed on the skin; some held themselves perpendicular to the skin with the head free and then bent over forcing the head into the stratum corneum while others pushed the head in while remaining parallel to the skin. After resting in the stratum corneum they make their way into the epidermis and thence into the loose subcutaneous tissue.

S.W.

(248f) In a collection of helminths from the gut of an East Greenland salmon, *Salvelinus alpinus*, Yeh reports three species of cestodes: *Diplocotyle olrikii*, *Eubothrium crassum* and *Diphyllbothrium salvelini* n.sp. The new species resembles *D. dendriticum* of birds but differs from it in the following characters: the scolex is more rounded; the neck is absent; the

genitalia are never duplicated in any of the segments; the number of testes in sections is very different, especially in sagittal sections where it is only one-half of that found in *D. dendriticum*; the vitellaria do not leave a clear space around the uterus and genital pores; the cirrus-sac is more anteriorly situated; and the uterus has only a few eggs. This is the first adult *Diphyllbothrium* species to be reported from a fish and the second from a cold-blooded animal. L.S.Y.

(248g) Yeh describes *Hepatojarakus malayae* n.g., n.sp., a bursate nematode from the biliary passages of *Rattus rattus jarak* from Pulau Jarak, Straits of Malacca, Malaya. *Hepatojarakus* resembles *Molineus* in many respects but differs noticeably from it in the length of the externo-lateral ray which is as long as the other rays and runs parallel to the ventrals. This is the first trichostrongylid to be reported from the liver of the rat. The author also records *Rictularia tani* from the intestine of the same host. He notes that each of the three buccal teeth is bifurcated so that three teeth point into the buccal capsule and the other three point downwards into the oesophageal lumen. L.S.Y.

(248h) Winslow describes a method for obtaining large numbers of cysts of *Heterodera* on host plants in pot culture. The plant is grown in a pot of infested soil which is plunged in a good potting compost so that some of the roots may grow through the pot into the compost and enable the plant to grow vigorously while large numbers of cysts are produced on the roots in the pot. A special type of funnel is described containing two removable sieves enabling cysts to be extracted quickly and in a fairly clean state from material floated from infested soil. A figure illustrates the sizes of sieve mesh most suitable for each of eight species of *Heterodera*. M.T.F.

(248i) McClelland describes and illustrates *Nematobothrium labeonis* n.sp. from three species of *Labeo* from the Nile. The new species is unique among the Didymozoidae in that it occurs free in the orbit of the host. *N. labeonis* resembles *N. lampridis* most closely but differs in that there is no clear division into forebody and hindbody, in the position of the ventral sucker behind the anterior ends of the testes and in the size of the eggs which are about twice as large; the new species is also similar to *N. molae* but differs in the greater length of the gut and in the possession of a single vitellarium. The classification of *Nematobothrium* is discussed. S.W.

(248j) After pointing out that *Aphelenchoides parietinus* as now known is probably an aggregate of several species, Franklin gives a detailed description of the female of this species; her material was obtained from the same source as that from which Bastian obtained the original material for his description of the species. No males were found. A comparison, in tabular form, shows how the true *A. parietinus* differs from a number of related species. M.T.F.

(248k) Ellenby's technique consists in burying a "basket", made from 36 mesh stainless steel gauze and containing potato root eelworm cysts, amongst the roots of the plants to be inoculated. The inoculum may be inserted and withdrawn as required and the cysts may subsequently be examined to determine how many larvae have hatched. M.T.F.

(248l) Peters presents and discusses the results of two experiments carried out in boxes of soil made up of separable horizontal layers, two inches deep. The first showed that an injection of D-D mixture sufficient to kill over 98% of *Heterodera rostochiensis* larvae in the deeper layers, killed only 32% or less in the top two inches, a situation that was only slightly improved by using a water seal or a foil cover over the soil. The second experiment showed that a combination of D-D mixture injected, and a micellar solution of *para-meta*-cresol drenched over the surface, killed the eelworms satisfactorily at all levels. There was no interaction between the two chemical agents. B.G.P.

(248m) Schuurmans Stekhoven & Mawson have studied the free-living marine nematodes collected by Paulian at Kerguelen Island. Of the seven species found *Thoracostoma antarcticum* and *T. campbelli* were already known to science and the morphology of the specimens in this collection is compared with the descriptions given by other authors; one specimen of an unidentified species of *Pontonema* and four new species are described and figured. These are *Thoracostoma anocellatum* n.sp., *Leptosomatides conisetosum* n.sp., *Rhabdodemia calycolaimus* n.sp. and *Phanoderma speculum* n.sp. S.W.

249—Journal of Neurosurgery. Springfield, Illinois.

- a. KIM, S. K., 1955.—"Cerebral paragonimiasis. Report of four cases." 12 (2), 89-94.

250—Journal of Parasitology.

- a. ULMER, M. J., 1955.—"Notes on the morphology and host-parasite specificity of *Fibricola cratera* (Barker and Noll, 1915) Dubois 1932 (Trematoda: Diplostomatidae)." 41 (5), 460-466.
 b. KUNTZ, R. E. & MALAKATIS, G. M., 1955.—"Susceptibility studies in schistosomiasis. IV. Susceptibility of wild mammals to infection by *Schistosoma haematobium* in Egypt, with emphasis on rodents." 41 (5), 467-475.
 c. SADUN, E. H. & NORMAN, L., 1955.—"The use of an acid soluble protein fraction in the flocculation test for the diagnosis of trichinosis." 41 (5), 476-482.
 d. CAMPBELL, C. H., 1955.—"The antigenic role of the excretions and secretions of *Trichinella spiralis* in the production of immunity in mice." 41 (5), 483-491.

(250a) Ulmer discusses the identity of the American species of *Fibricola*. Metacercariae from the pelvic muscles of *Rana pipiens* were fed to white mice and developed into adults many of which were intermediate between *F. cratera* and *F. texensis*. The distribution of the vitellaria has been previously considered the main distinction between the two species but in Ulmer's specimens there was considerable variation; in some specimens the follicles extend into the hind-body as far as the anterior level of the posterior testis while others had vitellaria on one side which extended to the posterior end of the posterior testis. The diplostomula resembled *F. texensis* in body length and width and *F. cratera* in measurements of oral sucker, acetabulum and holdfast. The genitalia are described in detail and illustrated. Ulmer is of the opinion that host specificity is not a sound basis for the separation of the Diplostomatinae from the Alariinae. S.W.

(250b) Kuntz & Malakatis exposed 256 rodents (*Mus musculus*, *Rattus rattus*, *Arvicanthis niloticus*, *Gerbillus pyramidum*, *Acomys cahirinus*, *Jaculus jaculus*, *Meriones shawi*, *Psammomys obesus* and *Nesokia indica*), 14 insectivores (*Hemiechinus auritus*) and eight carnivores (*Mustela nivalis*, *Herpestes ichneumon* and *Vulpes vulpes*) to cercariae of *Schistosoma haematobium*. The rodents were the most susceptible to infection; *Arvicanthis niloticus* appeared to be the best host producing large numbers of apparently normal adult schistosomes which deposited numerous eggs in different organs, and passing viable eggs in the faeces for approximately three years. Carnivores were not susceptible and the hedgehog was only a fair host. S.W.

(250c) Sadun & Norman prepared a crude larval *Trichinella* antigen and an acid soluble protein extract of *Trichinella* larvae and compared their reactions in rapid flocculation tests with sera from infected rabbits and pigs and from suspected human cases of trichinelliasis. Neither antigen was consistently more sensitive but the acid soluble fraction did occasionally confer a somewhat greater sensitivity to the flocculation test and produced a test which was easier to read and interpret; it could also be stored indefinitely. There were no consistent differences in the reactions of sera from the different host animals. S.W.

(250d) Campbell prepared an antigen which was associated with the excretions and secretions of *Trichinella spiralis* larvae (the ES antigen) and studied the immune effects produced in mice by injecting this antigen. The criteria of immunity used were: (i) counts of adult worms seven days or 7, 9, 11 and 13 days after a challenging infection, (ii) the length of the adult female worms, and (iii) counts of larvae recovered 30 days after a challenging

250—Journal of Parasitology (cont.)

- e. NEILAND, K. A., 1955.—“The helminth fauna of Nicaragua I. A new genus and species of cestode (Dilepidinae) from the hummingbird, *Phaeochroa cuvierii roberti*.” 41 (5), 495–498.
- f. COKER, C. M., 1955.—“Effects of cortisone on *Trichinella spiralis* infections in non-immunized mice.” 41 (5), 498–504.
- g. DRUDGE, J. H., LELAND, Jr., S. E., WYANT, Z. N. & ELAM, G. W., 1955.—“Studies on *Trichostrongylus axei* (Cobbold, 1879). I. Some experimental host relationships.” 41 (5), 505–511.
- h. NEWTON, W. L., 1955.—“The establishment of a strain of *Australorbis glabratus* which combines albinism and high susceptibility to infection with *Schistosoma mansoni*.” 41 (5), 526–528.

infection. His experiments showed that six injections of ES antigen at three-day intervals resulted in the production of immunity only as judged by counts of larvae; injection every two days gave a similar result. At post-mortem examination the intestines of injected animals were distended and contained a watery purulent substance which was not observed in the control mice. Further experiments showed that six injections of antigen at three-day and two-day intervals produced an immune response resulting in a more rapid loss of worms and the inhibition of growth in female worms. The experimental results are analysed statistically and tabulated. S.W.

(250e) Neiland describes and figures *Arostellina reticulata* n.g., n.sp. from the intestine of a humming-bird, *Phaeochroa cuvierii roberti*, in Nicaragua; only one helminth has previously been reported from a trochiliform bird. The new cestode is small, about 27 mm. long with a maximum width of 0.85 mm., has weakly developed suckers and the rostellum and other scolex armature are lacking. The genital pores alternate irregularly and the genital ducts pass dorsal to the excretory canals; the testes are numerous and lie behind and at the side of the ovary which is central; the vitelline gland and ootype lie in front of the ovary and the uterus is reticulated but does not break up into egg capsules. Although the anatomy of *Arostellina* presents a combination of characters not found in any cestode family known to the author, it is assigned to the Dilepidinae until additional closely related genera are found. S.W.

(250f) Coker has investigated the effect of treatment with cortisone on the normal defence of mice against infection with *Trichinella spiralis*. Daily injections of cortisone were given commencing two days before infection and continuing in one group to post-mortem examination and in another group until the 14th day after infection. In both these groups adults persisted longer in the intestine than they did in the intestines of uninjected and saline-injected control mice, and more larvae became established in the muscles. The experimental results also indicate that mature non-immunized mice develop a delayed immunity against an initial infection with *T. spiralis*. S.W.

(250g) Drudge *et al.* have studied the infectivity of five strains of *Trichostrongylus axei* for different hosts. All strains were from natural infections; three were from horses, one from cattle and one from sheep. A calf and lambs were infected directly from horses, and a horse strain retained its infectivity for the horse after passage through a calf and two lambs. Rabbits could regularly be infected directly with all five strains; the authors are of the opinion that although natural infection has only once been reported in the rabbit, it is likely that *T. axei* does occur in rabbits on pastures and that the infection has hitherto been overlooked. The bovine and one of the equine strains developed to maturity in guinea-pigs and hamsters but development was retarded and the infections were transient. Three rabbits remained patent for 194, 147 and 81 days respectively. Rats, which were exposed to the cattle strain only, did not become infected. *T. colubriformis* also developed to maturity in rabbits. S.W.

(250h) Newton, by crossing an albino strain of *Australorbis glabratus* which was resistant to a Puerto Rican strain of *Schistosoma mansoni* with a pigmented susceptible strain, has produced an albino strain which is susceptible. The new strain has been established as a colony. The relative transparency facilitates observations on live sporocysts moving about in the tissues of infected snails. S.W.

250—Journal of Parasitology (cont.)

- i. CHAN, K. F., 1955.—“The distribution of larval stages of *Aspiculuris tetraptera* in the intestine of mice.” 41 (5), 529–532.
- j. COIL, W. H., 1955.—“Notes on the genus *Maritrema* Nicoll, 1907 (Trematoda: Microphallidae) with the description of two new species.” 41 (5), 533–537.
- k. MARGOLIS, E., 1955.—“An unusual case of schistosomiasis with special epidemiologic aspects.” 41 (5), 538–541.
- l. SHUMARD, R. F., HERRICK, C. A. & POPE, A. L., 1955.—“The effect of diet on the length of third stage larvae produced by adult *Haemonchus contortus* harbored by lambs.” 41 (5), 542–544.
- m. MEYERS, H. F., 1955.—“Physical observations on *Echinococcus* eggs, Part I.” 41 (5), 548–551.

(250i) Chan has confirmed that the larvae of *Aspiculuris tetraptera* first migrate downwards in the intestines of mice and then upwards to their natural habitat in the proximal section of the large intestine. Larvae were found in the whole length of the large intestine as early as 24 hours after feeding infective eggs; 72 to 144 hours after infection most of the larvae were in the lower colon; 168 hours after infection the larvae reappeared in the proximal part of the large intestine and by the 11th day almost all the worms were in the first portion of the colon. S.W.

(250j) Coil reviews *Maritrema* and describes and illustrates two new Mexican species, *M. glandulosa* n.sp. from *Florida caerulea caerulea* and *M. patulus* n.sp. from *Tringa solitaria*. *M. glandulosa* is similar to *M. obstipum*, *M. medium* and *M. caridinae* but is differentiated by possessing a slightly lobed ovary, large unicellular glands in the parenchyma and an oral sucker which is larger than the ventral sucker, and in the disposition of the vitellaria in a median ring of small follicles. *M. patulus* is most closely related to *M. erolae* but may be distinguished from it by the thin-walled vagina, and from other species of the genus by the cuticle which is completely spinose, by the strongly lobed ovary, by the large cirrus sac and by the position of the genital pore behind and to the left of the acetabulum. The main characters of the 21 species of the genus are tabulated. S.W.

(250k) Margolis reports a case of schistosomiasis mansoni in an 18-year-old boy who had lived in Israel for five years. The infection had been acquired in the Yemen in early childhood but there had been no typical signs or symptoms. There was severe clubbing of the fingers and toes which was probably associated with the chronic intestinal infection. Treatment with potassium antimony tartrate caused a striking improvement after a second course. The epidemiology of *Schistosoma mansoni* in Israel is discussed. S.W.

(250l) Shumard *et al.* fed four groups of four worm-free lambs on a basal ration plus different mineral supplements, namely, iodized salt alone, and with cobalt, with manganese and with trace minerals. Three of each group were infected with *Haemonchus contortus* larvae, the fourth remaining uninfected as the control. Eggs from the faeces of the infected lambs from each group were cultured in the faeces of control lambs from every group. The mineral content of the culture media had no effect on the length of third-stage larvae. Highly significant differences due to the nutrition of the host from which the eggs came were observed, the larvae from lambs receiving cobalt or trace minerals being considerably longer. The authors conclude that the length of third-stage larvae is dependent on the nutrition of the parent worms, not on that of the two preceding larval stages. S.W.

(250m) Meyers has used Stokes' law to calculate the weight and density of eggs of *Echinococcus sibiricensis*. A Sedgwick-Rafter counting cell was used as the falling chamber and freshly boiled and cooled distilled water as the liquid medium. Velocity and radius were measured, volume was calculated from the radius, and weight from the rate of fall. The pertinent data on 12 separate determinations are tabulated. The average results were: volume 18.30×10^{-9} c.c., weight 20.44×10^{-9} gm., density 1.1184 and deviation of density from the mean 0.0153. Since weight and volume are directly proportional, $\text{weight} = 4/3\pi r^3 \times \text{density}$. S.W.

250—Journal of Parasitology (cont.)

- n. JOHNSON, F. R. & TODD, A. C., 1955.—“ ‘Aerosol OT 100%’, a wetting agent for molluscicides.” 41 (5), 553.
- o. MORSE, R. A., 1955.—“Larval nematode recorded from honeybee *Apis mellifera* L.” 41 (5), 553.

(250n) Johnson & Todd tested a number of wetting agents and detergents and found Aerosol OT 100% to be the most satisfactory for wetting molluscicides in the laboratory: 1 ml. of 3% and 1:1,000 concentrations effectively wetted 1 gm. of the test chemicals. s.w.

(250o) During examination of the contents of the abdomen of 2,111 honey-bees, Morse found two infected with larval *Agamomermis* sp. Each of the two bees contained a single specimen which almost filled the abdomen. s.w.

251—Journal of Pharmacy & Pharmacology. London.

- a. MACKIE, A. & PARNELL, I. W., 1955.—“A comparison of the results of four *in vitro* anthelmintic testing techniques.” 7 (6), 416-420.

(251a) Mackie & Parnell have made a comparative study of the anthelmintic effect of 52 compounds on the free-living stages of sclerostomes, on *Turbatrix aceti* and on preparations of *Ascaris lumbricoides* and *Fasciola hepatica* *in vitro*. Aliphatic compounds containing iodine or bromine appeared to be particularly effective against the sclerostome larvae, but aromatic halogen compounds were less effective except against liver-fluke. Allyl iodide and isothiocyanate were very effective against all four. Diphenylamine, 4-*n*-hexylresorcinol and gentian violet had little effect on the sclerostomes compared with the effect on the other three. Pyridines and quinoline were ineffective against *T. aceti* but effective against the other helminths. 2:3-dihydro-3-ketobenzo-1:4-thiazine was lethal to sclerostomes and it and its 6-chloro derivative were lethal to *T. aceti*: benzo-1:4-thiazine derivatives were paralyzant but not lethal to *F. hepatica*. Phenothiazine killed sclerostomes and *T. aceti* and phenothiazone was effective against all four. s.w.

252—Lighter. Experimental Farms Service Tobacco Division, Ottawa.

- a. MOUNTAIN, W. B. & KOCH, L. W., 1955.—“Nematode diseases of tobacco in Ontario.” 25 (1), 16-20.

(252a) The most important nematode diseases of tobacco in Ontario are those due to *Pratylenchus* spp. and, to a lesser extent, ectoparasites of which the most frequent is *Tylenchorhynchus claytoni*. Three species of *Pratylenchus* attack tobacco, *P. minyus*, *P. penetrans* and an undescribed species known as the “clover nematode”. Their distribution and relative importance are given and the crops on which populations are most quickly built up. For control of nematode root rots the authors recommend soil fumigation, resistant tobacco varieties and good agronomy, particularly as regards the maintenance of optimal mineral nutrition and soil moisture conditions. M.T.F.

253—Månedsskrift for Praktisk Lægegerning og Social Medicin.

- a. MÜLLER, S., 1955.—“Appendicopathia oxyurica.” 33 (1), 34-38.

254—Medical Technicians Bulletin. Washington. [Supplement to U.S. Armed Forces Medical Journal]

- a. WILLIAMS, J. S., POTTS, D. E. & HUNTER, III, G. W., 1955.—“The detection of helminth eggs using Triton (X-100).” 6 (3), 113-115.

(254a) Williams *et al.* examined, in the fresh state and preserved in formalin, 167 stools containing eight kinds of helminth eggs. They applied five variations of the Army Medical School technique for recovering eggs [see Helm. Abs., 17, No. 171a] and used Triton NE (X-30) or Triton X-100 as wetting agents. Provided that the Triton X-100 was used at the

rate of three drops diluted 1:2 with water or one drop undiluted, it could safely replace Triton NE (X-30). Three drops of undiluted Triton X-100 gave unsatisfactory results. M.MCK.

255—Medicina. Revista Mexicana.

- a. NETTEL F., R., 1955.—"Estudio referente a las dimensiones de la microfilaria *Onchocerca volvulus*." 35 (725), 241-249.

(255a) Nettel measured microfilariae of *Onchocerca volvulus* on 200 preparations obtained from skin biopsies, skin punctures, eye tissue, squeezed nodules and fixed sectioned nodules from treated and untreated patients in Mexico. He gives the average lengths and widths of the microfilariae obtained by the various methods and finds significant differences between these measurements. Larvae recovered by skin puncture from treated patients were on the average shorter and thicker ($240.7\mu \times 6.41\mu$) than those similarly recovered from untreated patients (which larvae measured $247.8\mu \times 5.63\mu$). A table gives the range of microfilarial measurements observed in the African and American continents by 13 other workers. M.MCK.

256—Meditsinskaya Parazitologiya i Parazitarnie Bolezni. Moscow.

- a. KROTOV, A. I., 1955.—[The age composition of a micropopulation of *Ascaris* and its practical significance.] 24 (1), 72-73. [In Russian.]
 b. BIZYULYAVICHYUS, S. K., 1955.—[The effect of cold temperatures on the viability of *Ascaris* and *Trichuris* eggs.] 24 (1), 74-75. [In Russian.]
 c. AVALISHVILI, S. D. & MAKHLINA, R. M., 1955.—[Experiment on the eradication of ancylostomiasis in the mountain regions of Adzhar ASSR.] 24 (1), 75-77. [In Russian.]
 d. BOBROV, B. F., 1955.—[Trichinellosis in wild animals.] 24 (1), 77-78. [In Russian.]

(256a) Krotov uses morphological characteristics rather than the size to divide the males of *Ascaris suum* and *A. lumbricoides* into a post-larval and a mature age group, and the females into two post-larval and three mature groups. This division allows the determination of the time of infection. 84% of ascarid "micropopulations" are composed of one or two groups near in age and only 16% of three or four such groups or of two groups distinct in age. The possibility of various age groups in the host should not be overlooked when anthelmintics are chosen and immunological reactions should be used to ascertain complete removal of worms. G.I.P.

(256b) Many *Ascaris* and *Trichuris* ova of various stages of development remained viable when enclosed in filter paper and placed out of doors from December to March, where the lowest temperature reached was -21°C . to -33.5°C . at the surface of the snow. *Ascaris* ova were more resistant to cold than *Trichuris* ova and the younger stages more than larval ones. Ova enclosed in filter paper when covered by snow survived better than those on the open ground. G.I.P.

(256c) An experiment made to eradicate ancylostomiasis, present in almost all villages of the mountain regions of Adzhar, by therapeutic measures only, utilizing the long winter period for disinfecting the environment, resulted in the almost complete removal of the infection. Only 0.3% to 0.7% of the population of two out of nine villages remained infected. Taking into account the length of life of *Ancylostoma*, eradication is possible in four years when a systematic examination of the population is followed by the treatment of infected persons early in each winter. G.I.P.

(256d) The examination of 152 wolves, of which 148 harboured *Trichinella*, revealed the presence of natural centres of mass infection with *Trichinella* in the Saratov region. The *Trichinella* in wolves was infective to mice, guinea-pigs, a dog and a pig when these were fed with infected wolf meat. G.I.P.

256—Meditsinskaya Parazitologiya i Parazitarnie Bolezni. Moscow (cont.)

- c. GRINBERG, G. D., 1955.—[Certain problems of statistics on helminthiasis.] **24** (1), 79–80. [In Russian.]
- f. SOROKIN, A. V., PUSHKAREVA, E. M. & KUZMINIKH, N. A., 1955.—[Opisthorchiasis in the Vyatka river basin.] **24** (1), 81. [In Russian.]
- g. KROTOV, A. I., 1955.—[Investigation of new anthelmintics of vegetable origin.] **24** (2), 99–106. [In Russian.]
- h. KOVALEV, N. E., 1955.—[Experimental treatment of taeniasis with male fern associated with acridine in the mass control of helminths.] **24** (2), 106–108. [In Russian.]
- i. UTKINA, I. M., 1955.—[The effect of the nervous system on the course of experimental Ascaris intoxication.] **24** (2), 108–114. [In Russian.]
- j. NAUMOVA, R. P., 1955.—[Antigenic properties of Ascaris and *Taenia saginata*.] **24** (2), 114–117. [In Russian.]

(256e) That statistical treatment of materials based on dissimilar data, or chance information, or on a small number of observations may lead to erroneous conclusions is shown by Grinberg in a discussion of a paper by James-Levi on the statistics of ascariasis which appeared in *Med. Parasit., Moscow*, 1952, No. 4. G.I.P.

(256f) *Opisthorchis* infection of cats is reported for the first time from the Vyatka basin. The local population eats freshly salted fish and, although no *O. felineus* eggs were found in 14 persons examined, the possibility of the population being infected cannot be excluded. G.I.P.

(256g) Various parts of 236 kinds of plants collected in the Moscow region and Transcaucasia were tested against ascarids *in vitro*. The plants were grouped and listed according to their efficacy and toxicity. Eighteen of the plants produced irreversible paralysis of the worms and can be used as anthelmintics against ascarids. The results show that new ascaricidal substances should be looked for among plants containing glucosides. A further 50 plants were tested *in vitro* against *Taenia taeniaeformis* using known anthelmintics as controls. *Imula helenium*, *Eucalyptus globulus*, *Populus nigra* and *Lactuca scariola* are recommended for testing against cestodes in animals. G.I.P.

(256h) Three methods of treatment of *Taenia* infections in man were compared. Of 17 people who were given male fern extract in doses according to age with a maximum of 6 gm. for adults, 52.94% passed worms with scolices; toxic effects were observed in as many as 11 cases. Of 52 persons who received half the above doses of male fern followed after 30 minutes by 0.3–0.35 gm. of acridine, 50% passed worms with scolices while only five showed transient side effects. The efficacy was 40% when ten people were treated with acridine only. The combined treatment proved to be the best method. As a result of these three treatments 51 persons also passed *Enterobius vermicularis*, 11 passed *Ascaris lumbricoides* and two *Trichuris trichiura*. G.I.P.

(256i) Utkina studied the effect of *Ascaris* intoxication on 14 healthy dogs, 13 dogs with various fistulae of the stomach and small intestine, and three from which the brain cortex had been partly removed. Internal irrigation with *Ascaris* extract or feeding dogs with 0.2 gm. and 0.6 gm. per kg. body-weight of the extract increased or decreased the secretion of the stomach and altered the concentration of urea in the blood and in the gastric juice. These changes are produced by reflex actions resulting from stimulation of various parts of the gut and are the consequence of a changed functional condition of the brain cortex. G.I.P.

(256j) Whole worm extract and polysaccharide fractions from *Ascaris lumbricoides* and *Taenia saginata* and protein fractions from *A. lumbricoides* were tested for their antigenic properties by inoculating rabbits. The formation of specific antibodies was determined by ring precipitation. The tabulated results show that the whole worm antigens were specific for the parasite and the most sensitive. Sera from rabbits inoculated with these antigens precipitated with all three *Ascaris* and both *Taenia* antigens respectively. The protein antigen

256—Meditsinskaya Parazitologiya i Parazitarnie Bolezni. Moscow (cont.)

- k. YARULIN, G. R., 1955.—[Contamination of the coastal zone of the Caspian Sea with eggs of geohelminths.] **24** (2), 117–120. [In Russian.]
- l. LAPSHINA, E. I., 1955.—[Experimental studies on the development of *Ancylostoma duodenale* larvae in soil in Turkmenistan.] **24** (2), 120–122. [In Russian.]
- m. BARCHENKO, L. I., 1955.—[Routes of infection with ascariasis in living quarters.] **24** (2), 122–125. [In Russian.]
- n. MERKUSHEV, A. V., 1955.—[Rotation of *Trichinella* infections in natural conditions and their natural foci.] **24** (2), 125–130. [In Russian.]

stimulated antibody production in only one out of three rabbits. The polysaccharide fractions were not antigenic but when used in conjunction with foreign proteins (killed bacterial cells) antibodies were found in a number of rabbits and these were specific to the polysaccharides. In order of ability to precipitate antibodies in immune serum the whole worm antigens were first and the polysaccharide fractions second. G.I.P.

(256k) The shore of a town on the Caspian Sea was being contaminated with helminth eggs from the town sewers. Out of 110 samples of surface water taken near the beach and up to 500 m. out to sea, 56 contained 1–15 *Ascaris* eggs and three, single *Trichuris* eggs [the volume of the samples is not given]; in 0.5 litres of sewage water entering the sea 200 eggs were found. 67 out of 93 eggs from the sewage and 18 out of 34 eggs from the sea were in the first stages of development. It was found that eggs remained viable in the sea but did not develop to the larval stage. When kept at 26°C. to 28°C., 15 out of 43 of the eggs reached the larval stage in 35 to 40 days. G.I.P.

(256l) The influence of temperature on the development of *Ancylostoma duodenale* larvae was observed throughout the year on a patch of sandy-clay soil, typical of Turkmenistan; this was irrigated every four to five days with diluted infected faeces, thus keeping the soil moisture constant. Five to ten soil samples were tested daily for the presence of larvae. Optimal soil temperatures for larval development occurred in April, September and October. No larvae were found from November to February when the temperatures were at their lowest, never reaching above 4°C. In May soil temperatures of 40°C. greatly reduced larval development; little development took place from June to August and in March. G.I.P.

(256m) The survival of *Ascaris* eggs was investigated by placing them on filters in various types of dwellings. When unsegmented eggs were placed on objects in a room 70% to 75%, only reached the infective stage when the relative humidity of the air was 85% to 97%. This is rarely encountered in homes. In cracks of floors which are washed regularly 35% to 43% of the eggs developed. Eggs in the pre-larval stage developed at 75% to 85% relative humidity. Infective eggs placed on objects of use remained viable for up to 26 days at 45.5% to 55% humidity and at 22°C. to 24°C., for up to one and a half months at humidities between 52% and 95% and for more than three months in basements used for storing vegetables with a humidity of 87% to 92% and temperatures of 8°C. to 10°C. *Ascaris* eggs are most frequently brought into domestic premises on contaminated vegetables. G.I.P.

(256n) Necrophagous beetles, part of the food of some carnivores, were allowed to feed on the trichinous carcass of a mouse. Adult *Necrophorus* did not swallow entire *Trichinella* but their larvae took up worms and cysts which remained infective for up to five days in the gut. In *Carabus coriaceus* and *Platysma* sp. *Trichinella* larvae were infective for up to six days. Various fly larvae swallowed large numbers of *Trichinella* which remained infective for up to eight days. Insects can be considered to be short term reservoir hosts transferring infections from carcasses to carnivores, omnivores and insectivores. Merkushev presents a scheme of the main ways of spreading trichinellosis in nature. The basic cycle of infection is among wild animals and the secondary cycle is associated with man; this is subdivided into the first link comprising cats, dogs, rats and mice, the second link comprising pigs and the third link man. G.I.P.

256—Meditsinskaya Parazitologiya i Parazitarnie Bolezni. Moscow (cont.)

- o. ZAK, M. R., 1955.—[Trichinella infection acquired from bear meat.] 24 (2), 130-131. [In Russian.]
- p. MARUASHVILI, G. M., 1955.—[History of the investigation of trichinelliasis in Georgia.] 24 (2), 181-182. [In Russian.]

(256 o) Zak gives the symptoms and blood picture of 11 people who became infected with *Trichinella* through eating bear meat. Muscle biopsy of the arm of one person confirmed *Trichinella* infection. Because the Kronotsk bear very rarely preys on domestic animals and *Trichinella* has not been recorded in pigs in Kamchatka, the author suspects that the infection in bears was acquired from rats. G.I.P.

(256 p) Published and unpublished data indicate that in Georgia *Trichinella* occurs in pigs and rats and occasionally in man. G.I.P.

257—Medycyna Weterynaryjna.

- a. STEFAŃSKI, W., 1955.—"Profilaktyka chorób inwazyjnych w hodowli zespółowej." 11 (4), 200-204.
- b. TRAWIŃSKI, A., 1955.—"Badania doświadczalne nad produkcją swoistych przeciwciał pasożytniczych przez króliki sztucznie zakażone domózwowo wągami świńskimi." 11 (5), 268-270. [English & Russian summaries pp. 269-270.]
- c. WALTER, T., 1955.—"W sprawie włośnicy." 11 (7), 407-408.
- d. STEFAŃSKI, W., 1955.—"Organizacja parazytologii w Z.S.R.R." 11 (8), 449-453.
- e. FUDALEWICZ-NIEMCZYK, W., 1955.—"Występowanie nicienia płucnego *Cystocaulus ocreatus* (Railliet & Henry 1907) u owiec w Polsce. Doniesienia tymczasowe." 11 (8), 458-459.
- f. ANCZYKOWSKI, F. & CHOWANIEC, W., 1955.—"W sprawie pojawienia się masowej inwazji *Paramphistomum cervi* u bydła w gromadzie O. (Przyczynek do badań kompleksowych)." 11 (9), 531-535.
- g. DOWGIAŁŁO, J., 1955.—"Zasady walki z pasożytami w spółdzielniach produkcyjnych i innych gospodarstwach rolnych." 11 (9), 535-536.
- h. TRAWIŃSKI, A., 1955.—"Włośnica (trichinellosis)." 11 (10), 578-586; (11), 643-652; (12), 708-713.
- i. WIECKOWSKI, W., 1955.—"Przypadek nieznacznej inwazji larw włośni w mięsie świńskim." 11 (11), 672-673.
- j. STASKIEWICZ, G., JUSZKIEWICZ, T. & ROMANOWSKA, M., 1955.—"Badania nad zachowaniem się poziomu wapnia, fosforu nieorganicznego, glukozy i cholesterolu w krwi owiec po podskórnym stosowaniu leczniczych dawek czterochorku węgla." 11 (11), 673-678. [English & Russian summaries p. 678.]
- k. STEFAŃSKI, W., 1955.—"Badania nad terapią robaczyicy płucnej owiec. Technika iniekcji dotchawicowych." 11 (12), 705-708. [French & Russian summaries pp. 707-708.]
- l. LATKIEWICZ, L., 1955.—"Leczenie syngamozji drobiu. Własny model igły do wprowadzania leków do tchawicy." 11 (12), 738-739.

(257a) This is a popular article, addressed to farmers, on the prophylaxis of helminth diseases of animals on collective farms for animal breeding. G.I.P.

(257b) *Cysticercus cellulosae* antigen has been proved to be effective for the diagnosis of cerebral cysticerciasis in man. To find how soon after the infection antibodies appear in the blood, cysticerci were introduced into the fourth ventricles of 18 rabbits. After 16 or 20 days specific antibodies were present in the dilution of 1:50 or 1:80 and in one rabbit 1:250. The titre rose to 1:100 or 1:200 in the second month, then usually fell to 1:75 in the third. On autopsy no lesions were found in the internal organs. In a number of rabbits coalescence of the cysticerci with the ventricle wall had occurred. G.I.P.

(257c) Walter reports that several people were taken ill after eating pork infected with *Trichinella* which had been overlooked at inspection. G.I.P.

(257e) *Cystocaulus ocreatus* is now reported from sheep of local origin in southern Poland. A short description of the larval stages is given. The first record in Poland was from sheep imported from Holland. G.I.P.

(257f) Considerable infection of cattle with immature forms of *Paramphistomum cervi* is reported from the Włodawsk region of Poland: the mortality was probably not more than 10%. Of 115 faecal samples examined 67.8% contained eggs. Clinical symptoms occurred mainly in young animals, resulting in a decrease in reproduction and in economic loss.

G.I.P.

(257i) Wieckowski reports a small outbreak of trichinelliasis in Poland. Seven people became infected through eating trichinous pork which had passed inspection. He tested 1,344 samples from the same pig and concludes that the infection of the various muscles is not uniform and that, with light infections, the prescribed trichinoscopy is insufficient.

G.I.P.

(257j) To determine the influence of carbon tetrachloride on four constituents of the blood, three experiments were done at intervals on ten sheep free from liver-fluke. In the first experiment 20 ml. of a mixture of 1.25 ml. of carbon tetrachloride to 11.4 ml. of liquid paraffin were injected subcutaneously into each sheep; in the second and third experiments 3 ml. of carbon tetrachloride only were used. The changes observed following the tests were: the calcium levels dropped by 1.37, 1.25 and 1.12 mg. per cent respectively but soon returned to normal, the glucose levels fell by 4.97, 14.07 and 7.39 mg. per cent and the cholesterol levels rose by 33.1, 32.65 and 30.67 mg. per cent. The inorganic phosphorus content was not affected.

G.I.P.

(257k) Stefański has shown experimentally that when an anthelmintic is injected intratracheally into sheep in a standing position it enters both lungs and does not as a rule reach the alveoli, but that if the sheep are lying on their backs and tilted on to one side, most of the dose goes into the desired lung and reaches the alveoli. Thus Orlov's method is not out of date.

G.I.P.

(257l) Ten out of 30 chicks with *Syngamus* infections died from suffocation when Lugol's solution in glycerin (1:4) was given by tracheal injection in doses of up to 0.5 ml. No deaths occurred when 40 chicks received 0.3 ml. of 5% sodium salicylate solution or when 40 chicks were given 0.5 ml. of aqueous Lugol's solution (1:15). Having encountered difficulties in the administration, the author prepared a long, curved injecting needle with a bulbous tip which enabled him to dose 1,226 chicks in three hours.

G.I.P.

258—Memorias de la Sociedad de Ciencias Naturales La Salle.

- a. DÍAZ UNGRÍA, C. & ALEMAN G., C., 1955.—“Un nuevo cestode para Venezuela. La *Cittotaenia pectinata* (Goeze, 1782) del conejo (*Sylvilagus floridanus margaritae*) de la isla de Margarita, Venezuela.” 15 (40), 69–73.

(258a) Díaz Ungría & Aleman describe *Cittotaenia pectinata*, of which they found heavy infections in the rabbit *Sylvilagus floridanus margaritae* on Margarita Island. This is the first record of the parasite in Venezuela.

M.MCK.

259—Memorias de la Sociedad Cubana de Historia Natural “Felipe Poey”.

- a. PÉREZ VIGUERAS, I., 1955.—“Contribución al conocimiento de la fauna helmintológica cubana.” 22 (1), 21–71.

(259a) Pérez Vigueras reports 26 species of trematodes found in Cuba, of which four are given as new and are described and figured: *Polystoma stellai* n.sp. from *Hyla septentrionalis*, *Proisorhynchus aguayoi* n.sp. in *Rypticus saponaceus*, *Pleurogonius longibursatus* n.sp. from *Eretmochelys imbricata*, and *Cricocephalus americanus* n.sp. from *E. imbricata*. This last is *C. delitescens* of Linton, 1910 nec Looss, 1899 renamed. *Capsala martinieri*, *C. poeyi*, *Encotyllabe monticellii*, *Proisorhynchus pacificus*, *Rhipidocotyle barracudae*, *Mordvilkovia gravis* n. comb. for *Dollfustrema gravidum*, *Adenogaster serialis*, *Glyphicephalus solidus*, *Pleurogonius candidulus*, *Diaschistorchis pandus*, *Barisomum erubescens*, *Cyclocoelum mutabile*, *Spaniometra variolaris*,

Clinostomum heluans, *C. complanatum*, *C. attenuatum*, *Rhytidodes gelatinosus*, *Dicrocoelium dendriticum*, *Platynosomum fastosum*, *Athesmia parkeri* and *Alcicornis carangis* are redescribed. In the last species the gut was a slightly elongate, post-equatorial sac on a level with the ovary. This is contrary to MacCallum's original supposition that an oesophagus was present anteriorly giving rise to a caecum. The paper is to be continued.

M.McK.

260—Mikrokosmos.

- a. ALLGÉN, C., 1955.—“Ein Drama im Mikrokosmos.” 44 (11), 249–250.
- b. HIRSCHMANN, W. & RÜHM, W., 1955.—“Die Entwicklung eines im Buchdrucker (*Ips typographus* L.) lebenden parasitischen Fadenwurms.” 44 (12), 279–281.

(260a) Allgén describes a tightly entangled group of six nematodes which he found in a sample from South Georgia collected by the Swedish South Polar Expedition of 1901 to 1903. Three of the nematodes appeared to be *Sabatiera* sp., probably *S. tenuicauda*, one was *Sphaerolaimus gracilis* and two *Viscosia langrunensis*.

M.T.F.

(260b) This is a popular account of the life-history and development of the allantonematid *Contortylenchus diplogaster* (the genus was described by Rühm in a dissertation “Die Nematoden der Ipiden”, Erlangen, 1950) in the bark beetle, *Ips typographus* L. From oviparous females, male and female larvae leave the host via the anus. Inseminated females attack the host larva, entering the anus and penetrating the intestinal wall to the body-cavity. Only three moults are recorded during development.

J.B.G.

261—Mitteilungen aus der Biologischen Bundesanstalt für Land- und Forstwirtschaft.

- a. GOFFART, H., 1955.—“Dringende Nematodenprobleme im Pflanzenbau.” No. 83, pp. 109–113. [Discussion pp. 114–115.]
- b. OOSTENBRINK, M., 1955.—“Bodenmüdigkeit und Nematoden.” [Abstract.] No. 83, p. 114. [Discussion pp. 114–115.]
- c. MEIJNEKE, C. A. R., 1955.—“Über die Bekämpfung der Bodenmüdigkeit bei Baumschulgewächsen mit Nematiziden.” No. 83, pp. 115–121. [Discussion p. 121.]
- d. BESEMER, A. F. H., 1955.—“Die Wahl eines geeigneten Nematizids.” No. 83, pp. 122–127. [Discussion pp. 127–128.]
- e. SCHUURMANS STEKHOVEN, J. H., BERENDS, J. & SOELISTIO, P., 1955.—“Eine neue Methode für das Isolieren von kleinen Mengen von Pflanzenälchen.” No. 83, pp. 128–129.
- f. HEY, A., 1955.—“Standorteinflüsse auf Biologie und Bekämpfung des Kartoffelnematoden.” No. 83, pp. 130–132. [Discussion p. 132.]
- g. NOLTE, H. W., 1955.—“Reizphysiologische Untersuchungen bei *Heterodera rostochiensis*.” No. 83, pp. 133–136.
- h. SCHMIDT, J., 1955.—“Zur Populationsdynamik des Kartoffelnematoden (*Heterodera rostochiensis* Woll.).” No. 83, pp. 137–139.
- i. KÄMPFE, L., 1955.—“Die Aktivität von Kartoffel- und Rüben nematoden bei verschiedenen Temperaturen und ihre Bedeutung für die Mittelprüfung.” No. 83, pp. 139–142. [Discussion p. 142.]

(261a) Goffart discusses what he considers to be the most pressing problems relating to plant nematodes. He first mentions host specialization (instancing new species of *Heterodera* with limited host range, the genus *Meloidogyne*, the different species of the “*Ditylenchus dipsaci* group”) and points out the economic importance of this factor. He then deals with bacterial and fungus diseases of nematodes, green manuring in the reduction of nematode population, and the fact that nematodes encourage some fungus diseases of plants. The possibility of nematodes transporting virus infections is also noted. Goffart ends his paper with a discussion of problems of control, with particular reference to crop rotation, chemical control and the development of resistant varieties.

A.E.F.

(261b) In his paper (printed in summary form only), Oostenbrink presents proof of the role of nematodes of the genera *Pratylenchus*, *Paratylenchus* and *Hoplolaimus* in the causation of symptoms of soil tiredness in root and grain crops and in young trees. This fact gives

possibilities for control among which Oostenbrink mentions crop rotation, soil sampling, the use of nematicides and manuring. A.E.F.

(261c) Meijneke has carried out tests with a number of substances in an attempt to control soil tiredness in tree nurseries. Chloropicrin was very effective but had undesirable side effects; ethylene dibromide was unsatisfactory and Nabam (a fungicide) had no effect. D-D mixture at a rate of 60 c.c. per square metre was the best substance tried. A.E.F.

(261d) Besemer reports that D-D mixture is more effective than ethylene dibromide and methyl bromide in controlling both soil tiredness in connection with outdoor flower growing and root-knot infection in glass-houses. Chloropicrin was also very effective out-of-doors but is much more expensive than D-D; the latter is at first slightly toxic to plants but this effect wears off and in the second year after treatment the yield is as good as, if not better than, when chloropicrin is applied. On sandy and light soils the harmful effects of D-D disappear after some four weeks, but in damp and humus-rich soils they are in evidence for much longer. A.E.F.

(261e) Schuurmans Stekhoven *et al.* describe a new technique for separating living from dead nematodes and for rapid counting off of small numbers of worms during nematicide tests. One end of a glass tube is covered with fine plankton gauze and placed upright in a small dish partly filled with water so that the covered end is below water level. When nematodes are put in the water inside the tube, the living ones quickly penetrate the gauze and collect in the dish which is now placed on a raised block and connected with a second dish (at a lower level) by means of a capillary tube with internal diameter of 0.3 mm. which passes over a raised block *en route*. The lower dish contains a fixed quantity of fluid or nematicide solution and as the nematodes are siphoned into it through the tube, they are counted under the binocular lens. In this way a total of 200 *Ditylenchus dipsaci* (25 in each of eight dishes) were counted off in ten minutes. A.E.F.

(261f) Hey reports that dimethyl dithiocarbamate acid methyl ester (DMCM), even at a rate of 100 gm. per square metre, is in some areas toxic to plants when used to control the potato nematode; in other areas no such effect was seen even when applied at higher rates. The toxic symptoms, which are described, occurred in light soils in Mecklenberg: they did not appear in humus-rich or colloid soils or in hill areas. In Thuringia there were no phytotoxic symptoms and good nematicidal action and improved yield were always evident although a maximal effect, as seen in areas with lower rainfall, was not reached. DMCM did best when applied first at 75 gm. to 100 gm. per square metre and after three to four week intervals once or twice again at 30 gm. to 50 gm. per square metre: this method reduced cyst counts to a minimum. Dinitro-*o*-cresol (DNC) had a nematicidal effect at least equal to DMCM. At a rate of between 100 gm. to 200 gm. per square metre only a "trace" of cysts could be found on potato roots and in most areas the effect of the treatment lasted for a further year. DNC has however a low phytotoxic threshold and soil cannot be treated in the spring as even a seven week interval before planting potatoes does not remove the risk of damage. In rainy areas autumn treatment is safe. A.E.F.

(261g) Nolte has carried out tests on the chemical stimulation of hatching of *Heterodera rostochiensis* larvae. Of 19 substances tested, only two showed marked activating effect. Permanganate of potash in concentrations of 0.2% to 0.5% showed marked action from February to June but in July became much less effective. Picric acid (0.01%, 0.025% and 0.05%) was much more stable in its effect and is recommended for use in testing the effect of nematicides on cyst content. A.E.F.

(261h) After a series of experiments in three successive years, Schmidt confirms that the increase in cyst population of *Heterodera rostochiensis* in the soil after a single crop of potatoes is in inverse ratio to the number of cysts present initially, i.e. a small initial cyst count leads to a much greater proportional increase of viable cysts than a large initial count. A.E.F.

(261i) Kämpfe has studied the reaction of *Heterodera rostochiensis* and *H. schachtii* larvae to varying temperatures in the laboratory. In his first experiment larvae were placed on a slide in a drop of water after cysts had been opened at room temperature (20°C.) and their movement studied for periods up to 48 hours. Movement was greatest after from 30 to 90 minutes and *H. schachtii* was more active than *H. rostochiensis*. When larvae were under a cover glass movements noticeably increased. Further experiments showed that the more mature the cysts the greater was larval movement. Hatching of larvae of both species took place most readily at a temperature of from 25°C. to 30°C. Maximum movement of *H. rostochiensis* was reached at temperatures between 26°C. and 30°C., and of *H. schachtii* at between 24°C. and 26°C. More work is necessary before larval reaction to temperature can be used in evaluating the efficacy of nematicides. A.E.F.

262—Monatshefte für Tierheilkunde.

- a. BOCH, J., 1955.—“Ergebnisse parasitologischer Kotuntersuchungen von gesunden Schlachtschweinen.” 7 (4), 74–80.

(262a) Boch has examined faecal specimens from 500 apparently healthy pigs of local origin at the Munich abattoir. Of these 392 (78.4%) were positive for helminths. The most common species found were *Oesophagostomum dentatum* (46.4%), *Hyostrogylus rubidus* (33.4%) and *Ascaris lumbricoides* (28.4%). In all eleven species were found and about 60% of the pigs harboured three or more species. A.E.F.

263—Monatshefte für Veterinärmedizin.

- a. VARGES, W., 1955.—“Abtöten von Trichinen durch Kälteeinwirkung.” 10 (7), 152–154.
b. HOHNER, L., 1955.—“Die Wirkung proteolytischer Fermente auf Nematoden des Sumpfbibers in vitro.” 10 (8), 174–175.

(263a) Varges kept a side of a trichinous pig carcass at a temperature of -17°C. and fed portions of it, known to contain encapsulated larvae, to golden hamsters at 24 hour intervals. Hamsters fed flesh after it had been at -17°C. for four days or longer were negative for *Trichinella* when killed seven weeks later. In another experiment trichinous pig meat kept at -24°C. for 14 hours did not produce infection in hamsters. Varges concludes that pig meat frozen so that its internal temperature is -12°C is fit for human consumption. A.E.F.

(263b) Hohner has tested *in vitro* the proteolytic enzyme preparation Vermizym against nematode parasites of nutria. In a 4% suspension at 40°C., *Trichuris myocastoris* completely disintegrated within one hour. *Strongyloides myopotami*, a parasite of great economic importance, was only affected after four hours in concentrations of 2%, 4%, 6% and 8% at 40°C.: 30% of the worms, although dead, showed no signs of disintegration. This confirms earlier reports of the resistance of other *Strongyloides* spp. to proteolytic enzymes. A.E.F.

264—New Zealand Medical Journal.

- a. HOWDEN, P. F., 1955.—“Hydatid cyst of the lung.” 54 (300), 197–202.

(264a) At the Green Lane Hospital, Auckland, thirty-one patients with hydatid cysts of the lung had no cysts elsewhere. Casoni and hydatid complement fixation tests were negative in ten cases. Twenty-one reacted to both, three were negative to one or other of the tests. Fourteen of the remaining eighteen were positive for the Casoni test and eleven for the complement fixation test. In three the complement fixation test was positive while the Casoni test was negative and three positive for the Casoni test were negative to complement fixation. Nine only showed eosinophilia. An account is given of the 40 operations performed and the postoperative convalescence and complications observed. R.T.L.

265—North American Veterinarian.

- a. ZIMMERMANN, W. J., SCHWARTE, L. H. & BIESTER, H. E., 1955.—“Incidence of trichiniasis in pork products.” 36 (5), 367-370.

(265a) No *Trichinella* larvae were found in the diaphragms of pigs in two large herds reared on a garbage-free diet, nor were trichinae present in rodents collected from the premises. Examination of over 600 pork sausages in 1944-45 in Iowa showed more than 11% of the bulk sausage and of the untreated link sausages to be infected. In 1953-54, when the regulations prohibiting the feeding of raw garbage were in force, less than 3% of the same kinds of sausages were infected. These and other statistics are examined and interpreted. When less than 20 trichinae were present in a 45 gm. sample examined by the Baermann technique, the compression method of detection was found to be unreliable. M.MCK.

266—North Carolina Medical Journal.

- a. BENBOW, Jr., E. P., 1955.—“Treatment of pinworm in children with terramycin.” 16 (5), 185-186.

(266a) Benbow has tested three dosages of terramycin hydrochloride in the treatment of *Enterobius* infection in children. All received the drug for ten days and were re-examined by N.I.H. swab ten days after the end of treatment. The group which received 10 mg. per lb. body-weight daily in four equal doses was freed from infection and no side effects were observed. Diarrhoea and loose stools occurred in a few children who received 10 mg. per lb. daily in a single dose or 100 mg. daily in four doses and the cure rate was not as high. It is emphasized that strict hygiene is necessary. S.W.

267—Nuovi Annali d'Igiene e Microbiologia. Rome.

- a. SAGGESE, S., 1955.—“Suggerimenti per la lotta alla echinococcosi.” 6 (1), 14-15. [English summary p. 15.]
 b. SAGGESE, S., 1955.—“Indagini sulla distribuzione degli elminti tra i cani e gatti randagi della Provincia di Campobasso.” 6 (1), 47-50. [English summary p. 50.]
 c. VENDRAMINI, R. & MAGAUDDA-BORZI, L., 1955.—“Proposta di una reazione intradermica per la diagnosi di massa dell'anchilostomiasi.” 6 (2), 81-89. [English summary p. 89.]
 d. AGOSTINUCCI, G., 1955.—“Osservazioni sull'efficacia dell'idrato di piperazina nelle infestazioni da *Enterobius vermicularis*.” 6 (2), 137-141. [English summary p. 140.]

(267b) Saggese gives the helminths found in 71 stray cats and 33 stray dogs examined post mortem in the Italian province of Campobasso. *Joyeuxiella pasqualei* was found in four cats. Two dogs had *Echinococcus granulosus*. The presence of *Ancylostoma tubaeforme* in four cats from Peitracatella, but no *Ancylostoma* in seven dogs found there, supports the theory that these hosts normally harbour different species. M.MCK.

(267c) Vendramini & Magaudda-Borzi mixed the powdered bodies of hookworms with ethyl alcohol, evaporated the liquid, redissolved the residue in physiological saline and recovered the supernatant. This was tested as a hookworm antigen on 62 people suspected of infection and on 75 uninfected individuals. At a titre of 1:450,000, which gave the best results, the skin test was positive in 57 out of 58 individuals found to be definitely infected and was falsely positive in 16 out of the total of 79 healthy persons (i.e. 75, plus 4 from the suspected group). If these results are confirmed on a larger scale the test may be of great value in epidemiological surveys. M.MCK.

(267d) Agostinucci has confirmed the efficacy of piperazine hydrate given in daily oral doses of 10 cg. for each year of age, or 2 gm. for adults, against *Enterobius vermicularis*. The treatment, given to more than 100 patients since 1945, lasts 21 days or two periods of 7-10 days separated by an interval of a few days. M.MCK.

268—Pakistan Journal of Science.

- a. TIMM, R. W., 1955.—“The occurrence of *Aphelenchoides besseyi* Christie, 1942 in deep water paddy of East Pakistan.” 7 (1), 47-49.

(268a) Timm has found *Aphelenchoides besseyi* in panicles of harvested paddy rice from near Dacca in East Pakistan. No disease symptoms were noticed. A description of the nematode is given. M.T.F.

269—Parasitology.

- a. STEWARD, J. S., 1955.—“Anthelmintic studies: I. A controlled critical entero-nemacidal test.” 45 (3/4), 231-241.
- b. STEWARD, J. S., 1955.—“Anthelmintic studies: II. A double entero-nemacidal anthelmintic test covering a wide range of activities.” 45 (3/4), 242-254.
- c. STEWARD, J. S., 1955.—“Anthelmintic studies: III. A taeniacid testing technique.” 45 (3/4), 255-265.
- d. STEWARD, J. S., 1955.—“Anthelmintic studies: IV. The loss of efficiency by division of the dose.” 45 (3/4), 266-268.
- e. MELLANBY, H., 1955.—“The identification and estimation of acetylcholine in three parasitic nematodes (*Ascaris lumbricoides*, *Litomosoides carinii*, and the microfilariae of *Dirofilaria repens*).” 45 (3/4), 287-294.
- f. REES, G., 1955.—“The adult and diplostomulum stage (*Diplostomulum phoxini*) (Faust) of *Diplostomum palmatoides* Dubois and an experimental demonstration of part of the life cycle.” 45 (3/4), 295-312.
- g. FRANKLAND, H. M. T., 1955.—“The life history and bionomics of *Diclidophora denticulata* (Trematoda: Monogenea).” 45 (3/4), 313-351.
- h. WEBBER, W. A. F., 1955.—“*Dirofilaria aethiops* Webber, 1955, a filarial parasite of monkeys. I. The morphology of the adult worms and microfilariae.” 45 (3/4), 369-377.
- i. HAWKING, F. & WEBBER, W. A. F., 1955.—“*Dirofilaria aethiops* Webber, 1955, a filarial parasite of monkeys. II. Maintenance in the laboratory.” 45 (3/4), 378-387.
- j. WEBBER, W. A. F., 1955.—“*Dirofilaria aethiops* Webber, 1955, a filarial parasite of monkeys. III. The larval development in mosquitoes.” 45 (3/4), 388-400.
- k. WEBBER, W. A. F. & HAWKING, F., 1955.—“The filarial worms *Dipetalonema digitatum* and *D. gracile* in monkeys.” 45 (3/4), 401-408.
- l. SARWAR, M. M., 1955.—“On a new lungworm, *Pneumostrongylus ovis* Sarwar, 1953, and some remarks on *Varestrongylus* species from sheep and goats in Pakistan.” 45 (3/4), 426-430.
- m. INGLIS, W. G., 1955.—“On the family Parasubuluridae van den Bergh & Vuylsteke, 1938, and the subfamily Numidicinae López-Neyra, 1945 (Nematoda).” 45 (3/4), 431-440.

(269a) Steward has developed a technique for the controlled critical testing of anthelmintics using *Heterakis spumosa* infections in laboratory rats. “Indirect” anthelmintic activity is detected by the comparison of results in treated and untreated animals; “direct” activity is shown by a comparison of the numbers of worms expelled by treated animals with the residual worm burden. The direct activity may not be the full anthelmintic activity as the worms may be affected by the chemical and destroyed by bacteria or enzymes. Observations on two strains of untreated infected rats showed that one strain normally lost 1.75% to 2% of the heterakids, the other 0.5%; this must be considered in the calculation of direct activity. Examples are given of the results of tests with various dosages of phenothiazine and with gentian violet, hexylresorcinol, diphenan and gammexane. S.W.

(269b) Continuing his work on the testing of anthelmintics, Steward extends the technique described in the previous paper [see No. 269a above] and uses rats infected with *Nippostrongylus muris* alone or in double infections with *Heterakis spumosa*. “Direct” activity cannot be calculated for *Nippostrongylus* as the worms are not expelled in the faeces after treatment. The effect of tetrachlorethylene or of *n*-butylchloride was used as a standard for comparison: phenothiazine and *n*-butylbromide were also tested. The double test is designed as a screening test for possible anthelmintics about which nothing is known; as all the anthelmintics which are active against *Enterobius*, strongyles (*Oesophagostomum*, *Chabertia*, *Strongylus* etc.), hookworms, trichostrongyles (*Haemonchus*, *Trichostrongylus* etc.) and *Ascaris* had some activity against one or other of the test infections it is reasonable to suppose that potential activity against these genera will be detectable by this test. The test is also of value

in studying variations in efficacy caused by changes in formulae or presentation of the drugs. To be effective anthelmintics should, strictly, act in a single dose and consequently tests reported on in this paper were made with single high doses. S.W.

(269c) In this third paper Steward describes the adaptation of his technique for testing anthelmintics to cestode infections. Mice experimentally infected with *Hymenolepis nana* were used. There is frequently considerable variation in the number of cestodes which become established in mice infected with the same number of cysticercoids and the size varies inversely with the number present; this together with the tendency of partially effective anthelmintics to act only on the larger tapeworms necessitated a form of computation of results based on size as well as number. The techniques are described in detail together with the results of tests of a number of known taeniocides. S.W.

(269d) It has been customary to use a single large dose of an anthelmintic when treating worms in animals, and a course of doses when treating man. In the case of phenothiazine the division of the dose was probably to avoid toxicity, although in fact the toxic danger may be increased by this practice. By laboratory techniques already described it has been shown that the division of an effective single dose into smaller parts causes almost complete loss of anthelmintic activity. To obtain the optimum effect a suitable concentration of the drug should be attained over a short period. D.M.

(269e) Mellanby prepared tissue extracts of adult males and females (both separately and together) of *Litomosoides carinii*, the anterior 4 mm. of *Ascaris lumbricoides* (including the nerve ring and ganglia) and strips of dorsal body wall of female *Ascaris*, and microfilariae of *Dirofilaria repens*. The extracts were assayed on leech muscle preparations with a standardized sensitivity. Substances similar to acetylcholine, and shown in the *Litomosoides* extracts probably to be acetylcholine itself, were demonstrated in all extracts. The amounts found expressed as $\mu\text{g. per gm.}$ of wet weight were: *Ascaris*, anterior end 0.39, body wall 0.025; *Litomosoides*, males 0.92, females 0.63; *Dirofilaria repens* microfilariae 2.4. S.W.

(269f) Rees examined several hundred *Phoxinus phoxinus* from a pool near Aberystwyth and found all of them infested with *Diplostomulum phoxini*. The fourth ventricle appeared to be the first part of the brain to be invaded; as the degree of infestation increased the worms extended forwards into the third ventricle and optic lobes and backwards into the spinal cord; they also occurred in the vitreous body and lens of the eye. The morphology, particularly of the excretory system, is described in detail and illustrated; there are 52 pairs of flame cells. When infested fish were fed to domestic ducks, adults which were identified as *Diplostomum pelmatoides* developed and are also described and illustrated. The average length of ten of the adults was 0.734 mm. and the eggs are very large in proportion to body size, measuring 0.087–0.093 mm. \times 0.048–0.062 mm. The specimens agree well with the original description given by Dubois. S.W.

(269g) Frankland examined 269 *Gadus virens* from the Fife coast and found 172 infected with *Dichidophora denticulata*. The flukes cause no apparent harm and there is some evidence of increasing resistance with age, probably due to mechanical difficulties; there was no evidence of premunition. Eggs were not observed to remain attached to the host; some stages of oocyte formation were studied and the haploid chromosome number is nine; cleavage is total and slightly unequal and hatching does not result from any special stimulus. The pre-swimming larva is gyroductyloid and its development, morphology and responses to stimuli are described and discussed. When maturity is reached the adult is a functional hermaphrodite at all times and reproduction continues throughout the year. Adults but not ciliated larvae are capable of some osmoregulation. Feeding is at least partly on the host's blood. S.W.

(269h) Webber now describes and illustrates *Dirofilaria aethiops*. [This filaria was named as a new species but not described by Hawking & McFadzean in the description of a laboratory demonstration published in *Trans. R. Soc. trop. Med. Hyg.*, 1954, 48, pp. 10-11, and subsequently referred to by Webber as "*Dirofilaria aethiops* Webber, in the press" in *Ann. trop. Med. Parasit.*, 1955, 49, pp. 123-141.] The recorded hosts are *Cercopithecus aethiops johnstoni*, (probably) *Colobus badius temmincki*, *Cercopithecus* sp. and five monkeys infected in the laboratory. The adults resemble those of other species of the genus but differ in the structure of the spicules; the microfilariae are indistinguishable from those of other species of *Dirofilaria*. *D. schoutedeni* is briefly redescribed and compared with *D. aethiops*. s.w.

(269i) The microfilariae of *Dirofilaria aethiops* show nocturnal periodicity. *Aedes aegypti* was a fairly successful vector under laboratory conditions. The prepatent period was from 47-51 weeks and the maximum duration of microfilaraemia was two years three months although only very diminished numbers were present in the blood at the end of two years. Adult worms were recovered from the fascial tissues and between the muscle bundles particularly of the thighs. Adults were removed from three monkeys post mortem and successfully implanted into normal monkeys. Six *Cercopithecus aethiops* and one *Macaca mulatta* were inoculated with a suspension of mosquitoes and infective larvae and became infected but seven other *C. aethiops*, one *Cebus apella* and one *Cercocebus* sp. similarly inoculated did not become infected. s.w.

(269j) Webber describes the morphology of the three larval stages of *Dirofilaria aethiops* in *Aedes aegypti*. For convenience, four forms are defined which are easily recognizable although they do not correspond with the stages delimited by moults. These are: (i) young larvae ($200\mu \times 4\mu$ to $250\mu \times 20\mu$), (ii) sausage forms ($250-400\mu \times 25-35\mu$), (iii) post-sausage forms ($400-600\mu \times 25\mu$ or more) and (iv) infective larvae (more than $600\mu \times 20-25\mu$). Larval development takes place in the connective tissue. The distribution of different stages in different parts of the mosquito from one to 24 days after infection is tabulated. There is a high larval mortality for the first two days after infection. Species may be distinguished by the tail of the first-stage larva which is the same as that of the microfilaria, the site of development of the second-stage larvae in the host which is characteristic, and the cephalic and caudal papillae of the third-stage larvae. s.w.

(269k) Webber & Hawking have studied natural infections of *Dipetalonema digitatum* in *Macaca speciosa* from Bengal and *D. gracile* in *Cebus apella* from Brazil. The microfilariae of both species were sheathless; those of *D. digitatum* showed nocturnal periodicity but those of *D. gracile* showed no periodicity. No development of the microfilariae of either species was observed in *Aedes aegypti*, *A. albopictus* or *Anopheles stephensi*, or of *D. digitatum* in *Anopheles quadrimaculatus* or of *D. gracile* in *A. maculipennis atroparvus*. Neither of the infections appeared to be pathogenic in the monkeys and no lesions were detected post mortem. The dimensions of adults and microfilariae of both species are tabulated and the morphology is briefly described. s.w.

(269l) Sarwar describes and figures *Pneumostrongylus ovis* n.sp. from the lungs of sheep and goats in Pakistan. The new species is differentiated from *P. calcaratus* and *P. tenuis* by the size of the spicules which are 0.28-0.30 mm. long compared with 0.384-0.421 mm. in *P. calcaratus* and 0.195 mm. in *P. tenuis*, and by the characteristic shape of the gubernaculum which is about 0.12 mm. long and consists of a weakly sclerotized corpus and well sclerotized crura with two stocky pedes at their distal ends. The pigmentation of the spicules is restricted to the beginning of their dorsal halves, thus distinguishing *P. ovis* from *P. calcaratus* and there is no longitudinal split in the middle of the spicules which distinguishes it from *P. tenuis*. Examination of the type specimens of *Varestrongylus pneumonicus* showed that a male *V. capricola* had been included with them and this explains the discrepancy between the spicule length recorded by Bhalerao and that found by the author. s.w.

(269m) Inglis reviews the family Parasubuluridae and reduces it to Parasubulurinae n.subf. in the Subuluridae; it contains two genera, *Parasubulura* and *Heterobulura*. The subfamily Numidinae, erected by López-Neyra in 1945, is emended to Numidicinae. *Oxyinema crassispiculum* is redescribed and found to have two spicules; *Numidica* consequently becomes a synonym of *Oxyinema* to which its five species are transferred as new combinations. *Baylis-numidica petrodromi* is redescribed and transferred to *Parasubulura* as *P. petrodromi* n.comb. *Oxyinema typicum* is considered to be a species *incertae sedis*. S.W.

270—Phytopathology.

- a. SASSER, J. N., LUCAS, G. B. & POWERS, Jr., H. R., 1955.—“The relationship of root-knot nematodes to black-shank resistance in tobacco.” 45 (8), 459–461.
- †b. ADAMS, R. E., 1955.—“Control of an ectoparasitic nematode injurious to deciduous fruit trees.” 45 (8), 464.
- †c. GOLDEN, A. M., 1955.—“Pathological effects of a spiral nematode on boxwood roots.” 45 (8), 464–465.
- †d. LORDELLO, L. G. E., 1955.—“Nematode attacking soybean in Brazil.” 45 (8), 465.
- †e. STEINER, G., 1955.—“Structure, function, and host in root-knot nematodes.” 45 (8), 466.
- f. ADAMS, R. E., 1955.—“Evidence of injury to deciduous fruit trees by an ectoparasitic nematode (*Xiphinema* sp.) and a promising control measure.” 45 (9), 477–479.
- g. LUCAS, G. B., SASSER, J. N. & KELMAN, A., 1955.—“The relationship of root-knot nematodes to Granville wilt resistance in tobacco.” 45 (10), 537–540.
- h. SASSER, J. N. & NUSBAUM, C. J., 1955.—“Seasonal fluctuations and host specificity of root-knot nematode populations in two-year tobacco rotation plots.” 45 (10), 540–545.
- i. ICHIKAWA, S. T., GILPATRICK, J. D. & McBETH, C. W., 1955.—“Soil diffusion pattern of 1,2-dibromo-3-chloropropane.” 45 (10), 576–578.

(270a) Experiments with tobacco varieties Dixie Bright 101 and Dixie Bright 102, which are respectively moderately and highly resistant to black-shank caused by *Phytophthora parasitica* var. *nicotianae*, showed that in the presence of *Meloidogyne incognita*, *M. incognita* var. *acrita* and *M. javanica* the mortality due to black-shank was considerable. With both pathogens present 75% to 100% of the plants were dead within three weeks and with the fungus alone 0% to 30%. The nematodes appear to have more influence in the pathogen complex than mere mechanical injury. J.B.G.

(270b) [A fuller account of this paper appears in *Phytopathology*, 45, 477–479. For abstract see No. 270f below.]

(270c) A new species of *Helicotylenchus* [neither named nor described in the author's abstract] caused stunting and brown necrotic lesions on the root systems of boxwood. The nematode injury probably consisted of mechanical destruction of the cells, chemical alteration of the cell contents and removal of cell contents in feeding. Staining with safranin-fast-green showed the extent of the damage. J.B.G.

(270d) [A fuller account of this paper appeared in *Pl. Dis. Repr.*, 34, 310–311. For abstract see *Helm. Abs.*, 24, No. 38m.]

(270e) Steiner states that the female root-knot nematode lies in the root with her ventral side towards the root surface thus enabling her various functions to be carried out efficiently; the stylet of the larval nematode is curved dorsally; the amphidial pouches of the male are large so that the efficiency of this chemical sense organ is increased; torsion of the male body is to ensure copulation. Torsion may be only 180° but may be as much as 900° (2½ turns). J.B.G.

(270f) “Pout”, a decline condition of apple trees, seems to be associated with the ectoparasitic nematode *Xiphinema* sp. The same nematode was found attacking peach trees. Treatment of the soil with single applications of benzene hexachloride (containing 10%

† Abstract of paper presented at the Annual Meeting of the Potomac Division of the American Phytopathological Society, Beltsville, Md, March 3–4, 1955.

gamma isomer) at 30 oz. or 36 oz. per 100 sq. ft. for one year and at 30 oz. per 100 sq. ft. for two successive years greatly improved the growth of the trees and reduced the population of *Xiphinema*. BHC at 90 oz. per 100 sq. ft. was toxic to the trees. The root system of the peach trees was greatly improved. J.B.G.

(270g) The tobacco variety Dixie Bright 101, which is moderately resistant to bacterial wilt caused by *Pseudomonas solanacearum*, was grown in soil to which the bacterium and *Meloidogyne incognita* var. *acrita* were added, together and singly. In plants doubly inoculated wilt symptoms developed earlier and more severely than in those exposed to the bacterium alone. The course of the disease was similar to that when plants with mechanically injured roots were exposed to the bacterium. The importance of controlling root-knot in the field in order to gain full benefit from the use of wilt resistant tobacco plants is stressed. J.B.G.

(270h) Data showing the fluctuations of populations of *Meloidogyne incognita*, *M. incognita* var. *acrita* and *M. arenaria* on plots carrying different types of two-year tobacco rotations are presented. The rotations were cotton-tobacco, maize-tobacco, peanuts-tobacco, weeds-tobacco, and oats-weeds-tobacco. All the rotations reduced the nematode populations so that a good crop of tobacco could be grown. Two strains of *M. incognita* var. *acrita* were encountered, one attacking cotton but not tobacco, the other attacking both plants. J.B.G.

(270i) Nemagon (1,2-dibromo-3-chloropropane) was injected into sandy soil eight inches deep at the rate of 0.22 ml. per foot, equivalent to 2.5 gallons per acre. The field carried a heavy infestation of root-knot. Samples of soil were taken at intervals of space and time and added to pots half-filled with sterilized soil. Tomato seeds were then sown. The experimental data are presented as diffusion patterns related to soil profiles. No effects were found one week after treatment but the effects increased from the second to ninth weeks. The nematicide had spread radially a distance of 15 inches by the ninth week. J.B.G.

271—Plant Disease Reporter.

- a. DROLSOM, P. N. & MOORE, E. L., 1955.—“The interaction of certain tobacco varieties and plant parasitic nematodes.” 39 (10), 703-704.
- b. BERGESON, G. B., 1955.—“The use of systemic phosphates for control of *Ditylenchus dipsaci* on alfalfa and daffodils.” 39 (10), 705-709.
- c. CAVENESS, F. E. & JENSEN, H. J., 1955.—“Investigations of various therapeutic measures to eliminate root-lesion nematodes from Easter lilies.” 39 (10), 710-715.
- d. GRANEK, I., 1955.—“Additional morphological differences between the cysts of *Heterodera rostochiensis* and *Heterodera tabacum*.” 39 (10), 716-718.
- e. TARJAN, A. C., 1955.—“Use of 3-p-chlorophenyl-5-methyl rhodanine as a soil amendment for nematode-infected strawberries.” 39 (11), 812-814.
- f. YOUNG, T. W. & RUEHLE, G. D., 1955.—“The role of the burrowing and meadow nematodes in avocado decline.” 39 (11), 815-817.
- g. NELSON, R. R., 1955.—“Nematode parasites of corn in the Coastal Plain of North Carolina.” 39 (11), 818-819.
- h. GOHEEN, A. C. & BAILEY, J. S., 1955.—“Meadow nematodes in strawberry plantings in Massachusetts.” 39 (11), 879-880.

(271a) Dixie Bright 101, a wilt resistant tobacco, was stunted by populations of *Pratylenchus* spp. (about 50 specimens per gm. of roots) whereas other older tobacco varieties tolerated about 380 eelworms per gm. of roots without showing symptoms. The poor state of the Dixie Bright 101 plants appeared to be a limiting factor in population build-up. *Tylenchorhynchus claytoni* built up equally on the two tobacco varieties but only caused damage to Dixie Bright 101. J.B.G.

(271b) In experiments on the control of *Ditylenchus dipsaci* in pot-grown lucerne seedlings, Bergeson compared the effectiveness of single drench and spray applications of OS-1836 (diethyl 1-chlorovinyl phosphate) at concentrations of 0.2%, 0.1% and 0.05%, formulated as a 20% concentrate in acetone with a 5% Triton X-100 emulsifier. Two weeks after treatment it was found that there was a significant reduction in the numbers of nematodes in all plants but

that there was no difference between drench and spray treatments. The 0.2% concentration was rather phytotoxic. Using a concentration of 0.1% it was shown that at least three sprayings at weekly intervals are necessary for elimination of the nematodes. A second series of experiments was carried out on daffodils infested with *D. dipsaci* treated with drenches of Systox, OS-1836 and OMPA (octomethyl pyrophosphoramidate) at concentrations of 1%, 0.5% and 0.1%, given in three weekly doses of 100 ml. each. Nematodes were extracted from the plants and counted one week and four weeks after the final treatment. OS-1836 gave complete control at both one and four weeks; with Systox control was not complete until the second examination and OMPA was only fairly effective. Leaf tip burn was produced by OS-1836 and Systox at the 1.0% and 0.5% levels but no phytotoxicity was recorded after OMPA. M.T.F.

(271c) Caveness & Jensen found that 92% of Croft Easter lily bulbs from field plantings having a history of infestation with *Pratylenchus* spp. were infested when examined after at least two months storage in peat at 35°F. When infested bulbs were forced there appeared to be no damage but the spread of the nematodes in the roots is undesirable. The removal of all root remnants from 25 bulbs eliminated the nematodes from 21 of them without adverse effect on their subsequent growth. Of a number of hot-water soak treatments tested, that at 128°F. for 10 minutes was most effective in killing the nematodes without damaging the bulbs although slight dwarfing was seen in field-grown plants. Twelve chemicals used as dips for five and 30 minutes all proved either phytotoxic or not nematocidal at the concentrations used, possibly because the roots were not effectively penetrated. Of seven chemical fumigants used under vacuum, 100% toxicity to nematodes with normal growth of the plants was given by ethylene dibromide for 15 hours, chlorobromo-propene for seven hours (both at 50 lb. per 1,000 cu. ft.), formaldehyde at 34 lb. per 1,000 cu. ft. for 15 hours and PN-1414 (ethylisothiocyanate) at 38 lb. per 1,000 cu. ft. for two hours. It was found necessary to use an indicator plant (*Vicia villosa* Roth.) for determining survival of *Pratylenchus* after treatments. M.T.F.

(271d) Granek finds that in cysts of *Heterodera rostochiensis* the distance of the anus from the nearer edge of the vulval opening averages 4.6 times the diameter of the vulval opening, and that in 97% of cysts the ratio exceeds 3. In cysts of *H. tabacum* this ratio averages 1.5 and is below 2 in 93% of cases. This character is considered to be an additional means of separating cysts of these two species. M.T.F.

(271e) In a strawberry field found naturally infested with *Pratylenchus penetrans* tests were made with N-244 (3-*p*-chlorophenyl-5-methyl rhodanine) at rates of 500, 300 and 100 lb. per acre hoed into the soil to a depth of 4-6 inches in a band 1 ft. wide each side of the rows of strawberries. The treatment was given in July. Yields and counts of nematodes in the soil the following season indicated an increase in crop and a decrease in the numbers of nematodes. M.T.F.

(271f) Young & Ruehle find that *Radopholus similis* and *Pratylenchus brachyurus* are wide-spread on avocados in Florida, the latter usually being the more numerous. In contrast to the case with citrus trees the nematodes are not necessarily associated with a condition of decline in avocados. Inoculation experiments carried out with both species of nematode show that both could increase to high numbers without causing marked disease symptoms. Avocados thus appear to be more tolerant to these nematodes than citrus. M.T.F.

(271g) Nelson has made a preliminary survey of "problem" maize fields in the Coastal Plain region of North Carolina and has found "high populations" of *Meloidogyne* spp., *Belonolaimus gracilis*, *Tylenchorhynchus claytoni*, *Trichodorus* spp. and *Pratylenchus* spp. M.T.F.

(271h) In a survey of 24 strawberry plantings in Massachusetts, the authors found root-knot galls (due to *Meloidogyne hapla*) in two and meadow nematodes (*Pratylenchus* sp.) in 20 samples. The plants were rated for severity of black root rot but numbers of meadow nematodes did not always correspond with severity of symptoms. The ratings and counts of meadow nematodes per gramme of feeder rootlets are given. M.T.F.

272—Plant Pathology. London.

- a. REID, E., 1955.—“A rolling method for opening cysts of potato root eelworm.” 4 (1), 28–29.
- b. BROWN, R. B., 1955.—“New or uncommon plant diseases and pests in England and Wales. Eelworm in scabious.” 4 (1), 32.
- c. JONES, J. M., GRIFFITHS, D. J. & HOLDEN, J. H. W., 1955.—“Varietal resistance in oats to attacks by the stem and bulb eelworm.” 4 (2), 53–43.

(272a) Reid describes a method for extracting the eggs from cysts of *Heterodera rostochiensis* by crushing the cysts in a film of water by means of a roller held at a distance of 0.005 in. above the surface on which the cysts lie. The crushed cysts are then washed into a 100 ml. tube where the suspension is stirred with an electric stirrer to break up the aggregates of eggs. Little damage is sustained by the eggs. The method is easier, and at least as efficient as that of cutting the cysts individually, but is not appreciably quicker. M.T.F.

(272b) *Aphelenchoides fragariae* was found for the first time attacking *Scabiosa caucasica* “Clive Greaves”. The eelworms were within the leaves which were dying off. A record of simultaneous attack by *A. fragariae*, *A. ritzema-bosi* and *A. blastophorus* is mentioned. J.B.G.

(272c) Field trials were carried out from 1950 to 1952 in which the oat varieties Grey Winter, Early Grey Winter, Unique, Picton, S.81, S.172, S.147, S.225 and “S.147 mixture” were compared for resistance to attack by *Ditylenchus dipsaci*. Of the resistant varieties all save Picton were found to be resistant under the very stringent experimental conditions. Picton showed considerable tulip-root and had a poor stand and low yield. *D. dipsaci* entered oat seedlings of both susceptible and resistant varieties. It caused some loss of plant followed by very slight tulip-root in the resistant varieties. In the susceptible variety S.147, heavy loss, severe tulip-root and high nematode populations occurred. There are five tables of comparative data. J.B.G.

273—Polski Tygodnik Lekarski. Warsaw.

- a. ABRAMOWICZ, A. & FENIGSEN, R., 1955.—“Przypadek paragonimosis westermani.” 10 (9), 275–278. [English & Russian summaries pp. 65*, 67*.]

274—Practitioner.

- a. LLOYD, E. L., 1955.—“Mepacrine in the treatment of tapeworm infestation.” 175 (1045), 59–61.

(274a) Lloyd reports the successful use of mepacrine for tapeworm infections in man. The patient is prepared for treatment by dosing with 60 ml. of saturated sodium sulphate solution in the morning and evening of the first day and by having fluids only and 2 gm. of sodium bicarbonate in water thrice on the second day. On the third day 1 gm. of mepacrine is given in the early morning followed by 60 ml. of saturated sodium sulphate, and a soap and water enema if necessary. S.W.

275—Prensa Médica Argentina.

- a. GAYET, E. P., ANDRADE PORTELA, R. I. J. & LASCANO, E. F., 1955.—“Pericarditis constrictiva hidatídica.” 42 (7), 442–446.
- b. WAKS, J., 1955.—“Nuevas aplicaciones de la piperazina. La enterobiasis intestinal.” 42 (10), 674–681.

(275b) Waks reports his success in treating *Enterobius* infections with the citrate and hexahydrate of piperazine. Twelve patients received 75 mg. and eight patients received 50 mg. per kg. body-weight daily. This was given in two treatments, each lasting seven days, separated by a week's rest. In the cases treated at the 75 mg. dose rate the whole cycle was repeated twice more at intervals of 15 days. Waks reports three cases in which piperazine treatment had to be discontinued on account of toxic effects (increased anal pruritus, colic and dizziness). He also describes the life-cycle and morphology of *Enterobius vermicularis*. M.MCK.

276—Priroda. Moscow.

- a. TARASOV, V. R., 1955.—[Coenurus in the steppe antelope.] Year 1955, No. 6, p. 119. [Imm. Russian.]

(276a) A steppe antelope (*Saiga tatarica*) with a *Multiceps multiceps* cyst in the right brain was found near a farm in the Stalingrad region. Trepanning to remove an egg-sized cyst was successful and the antelope, fully recovered, returned to its wild life after six days.

G.I.P.

277—Proceedings. Association of Southern Agricultural Workers.

- a. WARREN, E. P., 1955.—“Observations on the effects of drenching ewes with phenothiazines during early pregnancy.” [Abstract.] 52nd Annual Convention (1955), p. 61.
- b. GRAHAM, T. W., 1955.—“Pathogenicity of *Rotylenchus brachyurus* on tobacco and *Cricone-moides* sp. on tobacco and peanuts.” [Abstract.] 52nd Annual Convention (1955), pp. 142–143.
- c. HOLDEMAN, Q. L., 1955.—“The effect of the tobacco stunt nematode on the expression of Fusarium wilt in flue-cured tobacco.” [Abstract.] 52nd Annual Convention (1955), p. 143.
- d. MARTIN, W. J., NEWSOM, L. D. & JONES, J. E., 1955.—“Relationship of nematodes of the genera *Meloidogyne*, *Tylenchorhynchus*, *Helicotylenchus* and *Trichodorus* to the development of Fusarium wilt in cotton.” [Abstract.] 52nd Annual Convention (1955), p. 143.
- e. KRUSBERG, L. R. & SASSER, J. N., 1955.—“The lance nematode, *Hoplolaimus coronatus* Cobb, a parasite of cotton.” [Abstract.] 52nd Annual Convention (1955), pp. 143–144.
- f. NUSBAUM, C. J., 1955.—“Variable effects of nematocides on parasitic nematode populations in row fumigated tobacco plots.” [Abstract.] 52nd Annual Convention (1955), p. 144.
- g. NUSBAUM, C. J. & SASSER, J. N., 1955.—“Comparison of EDB (W-85) and D-D applied as liquids and impregnated on vermiculite for nematode control.” [Abstract.] 52nd Annual Convention (1955), p. 144.
- h. TARJAN, A. C. & CHEO, P. C., 1955.—“Reduction of root-parasitic nematode populations in established bent grass turf by use of chemical drenches.” [Abstract.] 52nd Annual Convention (1955), pp. 144–145.
- i. FELDMESSER, J. & FEDER, W. A., 1955.—“Organic mercury dips for the control of nematodes in roots of living plants.” [Abstract.] 52nd Annual Convention (1955), p. 145.
- j. MOORE, E. L., DROLSOM, P. N. & CLAYTON, E. E., 1955.—“High black shank resistance and tolerance to parasitic nematodes in flue-cured tobacco.” [Abstract.] 52nd Annual Convention (1955), p. 146.
- k. ALLISON, J. L., 1955.—“Nematodes and grassland farming.” [Abstract.] 52nd Annual Convention (1955), p. 188.

(277b) [This abstract has also appeared in *Phytopathology*, 1955, **45**, 347. For abstract see Helm. Abs., **24**, No. 139d.]

(277d) [This abstract has also appeared in *Phytopathology*, 1955, **45**, 349. For abstract see Helm. Abs., **24**, No. 139g.]

(277e) [This abstract has also appeared in *Phytopathology*, 1955, **45**, 349. For abstract see Helm. Abs., **24**, No. 139f.]

(277f) [This abstract has also appeared in *Phytopathology*, 1955, **45**, 349. For abstract see Helm. Abs., **24**, No. 139i.]

(277g) [This abstract has also appeared in *Phytopathology*, 1955, **45**, 349–350. For abstract see Helm. Abs., **24**, No. 139j.]

(277h) [This abstract has also appeared in *Phytopathology*, 1955, **45**, 350. For abstract see Helm. Abs., **24**, No. 139k.]

(277i) [This abstract has also appeared in *Phytopathology*, 1955, **45**, 347. For abstract see Helm. Abs., **24**, No. 139c.]

(277j) [This abstract has also appeared in *Phytopathology*, 1955, **45**, 349. For abstract see Helm. Abs., **24**, No. 139h.]

(277k) [This abstract has also appeared in *Plant Dis. Repr.*, 1955, **39**, 343–344. For abstract see Helm. Abs., **24**, No. 140a.]

278—Proceedings of the Royal Society of Medicine.

- a. TAYLOR, E. L., 1955.—“An ecological view of the non-specific factors controlling parasitic disease.” [Symposium on factors influencing host-parasitic relationships.] 48 (12), 1059-1062. [Discussion pp. 1065-1066.]
- b. STEWART, T. M., 1955.—“Visceral eosinophilia,” 48 (12), 1106.

(278a) In this survey of the oecology of host-parasite relationships, Taylor cites a number of helminths as examples of different aspects. In so far as old (in the evolutionary sense) parasites are concerned, disease is the outcome of interference with the oecological balance. In communities of parasites a balance between the reproduction potential and environmental limitations must be maintained for survival. This is an exceedingly delicate balance and if the parasite population increases beyond its normal limits disease may result. In the discussion Bensted drew attention to the presence of natural complement-fixing antibody to hydatid antigen in the sera of normal rabbits which, he has confirmed, is not associated with the presence of any other tapeworm infection. The fact that scolices of *Echinococcus* did not remove the reacting substance from rabbit sera suggests that the reaction is non-specific. S.W.

(278b) Stewart describes a fatal case of visceral eosinophilia in a child $3\frac{1}{2}$ years old. Post-mortem examination revealed small nodules in the tissue and on the surface of the lungs and on the surface of the liver, myocardium and pancreas. A larval nematode was found in a section of the lung. S.W.

279—Progresso Veterinario. Turin.

- a. PELLEGRINI, D. & CILLI, V., 1955.—“L'idatidiosi in Italia.” 10 (14), 505-506, 508, 510-511, 513-514, 516-518, 520-522.

(279a) [This paper has also appeared in *Ann. Sanità pubbl.*, 1955, 16, 81-106. For abstract see *Helm. Abs.*, 24, No. 65a.]

280—Quarterly Journal of the Florida Academy of Sciences.

- a. HARGIS, Jr., W. J., 1955.—“Monogenetic trematodes of Gulf of Mexico fishes. Part VII. The superfamily Diclidophoroidea Price, 1936. (Continued.)” 18 (2), 113-119.

(280a) Hargis reviews the genus *Mazocraeoides* and describes and illustrates *M. opisthonema* n.sp. from the gills of *Opisthonema oglinum*. The new species is more closely related to *M. georgei* than to *M. dorosomatis* but differs from the former in the position and shape of the ovary and testis, the number and arrangement of the genital spines, the extent of the vitelline reservoir and the host. Two redescriptions of *M. georgei* are given based on specimens from two different hosts and localities; there appear to be certain small but constant morphological differences between the two groups of specimens and further studies may reveal differences of specific or subspecific value. The first group was collected from the gills of *Brevoortia patronus* at Alligator Harbor, Florida and the second group from *Pomolobus* spp. at Woods Hole, Mass. S.W.

281—Report of the Hokkaido National Agricultural Experiment Station.

- a. ICHINOHE, M., 1955.—[Studies on the morphology and ecology of the soy bean nematode, *Heterodera glycines*, in Japan.] No. 48, 64 pp. [In Japanese: English summary pp. 59-64.]

(281a) Ichinohe gives a detailed description of all stages of *Heterodera glycines* as found on soya beans in Japan. Observations on the life-cycle indicate that a maximum of three generations may be completed in one season. Experiments on hatching responses to root diffusates gave negative results. Cysts exposed to a temperature of -40°C . for seven months still contain viable eggs. *Glycine ussuriensis* is a new host record. The author also describes *Heterodera major* found on wheat at two places and records *Digitaria ciliaris* [= *D. sanguinalis*] as a new host of this species. M.T.F.

282—Revista de Agricultura. São Paulo.

- a. LORDELLO, L. G. E., 1955.—“Nematódeos de interesse agrícola assinalados em São Paulo.” 30 (1/3), 27–30. [English summary p. 30.]

(282a) Lordello mentions 14 genera of nematodes that have been reported from soils in São Paulo State, Brazil, and are recognized as, or suspected to be, plant parasites. Some consideration is given to their importance, hosts and distribution. M.MCK.

283—Revista Brasileira de Biologia.

- a. FREITAS, J. F. TEIXEIRA DE, 1955.—“Nota sobre a fauna helmintológica de répteis brasileiros.” 15 (3), 279–284.
b. LOBATO PARAENSE, W. & DESLANDES, N., 1955.—“Studies on *Australorbis centimetralis*. I. Morphology, in comparison with *A. glabratus*.” 15 (3), 293–307.

(283a) Reporting species from Rio de Janeiro, Freitas notes that *Hastospiculum digiticaudum* n.sp. from the snake *Philodryas aestivus* is unique among the species of the genus in having caudal alae on the male which do not reach down to the tail tip. Some measurements and drawings are given for *Oswaldocruzia subauricularis* from the lizard *Enyalus catenatus* and for *Falcaustra mascula* from the snake *Leimadophis poecilogyrus*. These constitute new host records. M.MCK.

284—Revista Brasileira de Medicina.

- a. NAUCK, E., 1955.—“Investigações experimentais sobre a resistência adquirida nas infecções por esquistossomas.” 12 (1), 3–9. [English summary pp. 8–9.]

(284a) In an address to a conference at the University Hospital of São Paulo, Nauck reviews some of Vogel & Minning's experiments on the resistance of Rhesus monkeys to repeated infections with *Schistosoma japonicum*. [The full account of this work appeared in *Z. Tropenmed. u. Parasit.*, 1953, 4, 418–505, for abstract see *Helm. Abs.*, 22, No. 709a.] M.MCK.

285—Revista Ibérica de Parasitología.

- a. GONZÁLEZ CASTRO, J. & FERNÁNDEZ AMELA, T., 1955.—“Antígeno colesterinado a base de líquido celómico, para una nueva prueba de floculación en las ascariidosis.” 15 (4), 281–300. [English summary p. 297.]
b. SIMÓN VICENTE, F., 1955.—“*Brachylaemus* en infestación experimental y natural.” 15 (4), 301–320.

(285a) González Castro & Fernández Amela discuss the presence of ascarids in organs other than the intestine and point out the importance of immunological tests to discover their presence. They prepared two *Ascaris* antigens by a modification of the Suessenguth & Kline method. The alcoholic solution of cholesterol was added drop by drop to a mixture of water and fluid from the body cavity of *Ascaris* of the pig. To this was added a little 0.1% sodium carbonate solution. The new method produced smaller and more uniform crystals and a more sensitive and more stable antigen. This antigen is referred to as A.O. The second antigen, named A.O.L., was prepared by washing the cholesterol crystals repeatedly in physiological saline. The antigens reacted positively with the sera of sheep, cattle, pigs and goats infected with ascarids. They reacted negatively with sera from animals infected with *Trichuris*, *Trichinella*, *Fasciola* and hydatid, from rabbits injected with *Enterobius* extract or hydatid liquid, and from uninfected animals. The A.O. antigen was more stable but less sensitive than A.O.L. and varied considerably from sample to sample. Tests with A.O.L. on the sera of rabbits infected with pig *Ascaris* were positive from the fifth day and the maximum titre was 1:256 [1:125 is given in the English summary]. In 17 people passing *Ascaris* eggs the titres of A.O.L. ranged from 1:4 to 1:128 and in an exceptional case reached 1:1,000 in a woman with a diffuse granulomatous lesion of the liver. M.MCK.

(285b) Simón Vicente examined nearly 2,000 molluscs from his laboratory gardens in Salamanca (Spain) and found larvae of *Brachylaemus erinacei* in *Helicella* (*Microxeromagna*) *stolismena*, *H. (Cernueta) variabilis*, *H. (Helicella) ericetorum*, *H. (Xeromagna) arigonis* and *Agriolimax reticulatus*. The last two were the most heavily and most frequently infected species. Sporocysts were rare. Cercariae were more often found in the spring and metacercariae predominated in the winter. Some of the larvae were administered to several vertebrates and they developed in sparrows and mice. Simón Vicente describes the larvae and adult and tabulates their measurements against measurements previously recorded. He gives also the measurements of *Brachylaemus* adults which were found in all the sparrows (*Passer domesticus*) shot in the grounds during and after the end of April. M.MCK.

286—Revue d'Élevage de Médecine Vétérinaire des Pays Tropicaux.

- a. FLOCH, H., 1955.—"La pathologie vétérinaire en Guyane française. (Les affections des porcins, des caprins et des ovins)." 8 (1), 11-13.

(286a) Floch notes that in French Guiana *Stephanurus dentatus* is wide-spread but not serious. *Metastrongylus elongatus* is so common that practically all the pig lungs at the abattoir in Cayenne are discarded. *Oesophagostomum venulosum* was found in goats in 1943. M.MCK.

287—Revue de Médecine Navale (Métropole et Outre-Mer).

- a. DUBERNAT, 1955.—"Formes cliniques de l'ascaridiose." 10 (1), 49-57.

288—Revue de Pathologie Générale et Comparée.

- a. DEBELMAS-LORENTZ, A. M., 1955.—"Contribution à l'étude du pouvoir anthelminthique des essences végétales et de certains de leurs constituants." 55 (664), 2-51.
b. SAVEL, J., 1955.—"Études sur la constitution et le métabolisme protéiques d'*Ascaris lumbricoides* Linné, 1758." 55 (664), 52-121; (665), 213-279. [Spanish summary pp. 278-279. Discussion pp. 279-282.]

(288a) This paper is continued from *Rev. Path. gén. comp.*, 1954, 54, 1343-1404 and it is impossible in an abstract to do more than indicate the scope of the work which is described in it. Debelmas-Lorentz has carried out a detailed study of the anthelmintic properties of a large number of vegetable oils and certain of their constituents. The chemicals were tested on *Rhabditis macrocerca*, anterior preparations of an entire *Ascaris lumbricoides* in vitro, and oxyurids and cestodes in mice and the effects were compared with the effect of chenopodium oil. Chemicals belonging to the following series were studied: cinnamic, aldehydes, alkylphenols, hydrocarbons, acyclic terpene derivatives, oxygenated cyclic derivatives, ketones and other substances (bornyl acetate etc.). A number of the oils showed striking activity against the nematodes and there is evidence that certain chemical groups are particularly active. The paper is illustrated with numerous tables, and kymographs of the different effects on anterior *Ascaris* preparations and there is a bibliography of 115 titles. S.W.

(288b) Savel has made a detailed study of the protein metabolism of *Ascaris lumbricoides* from the pig. In the perivisceral fluid non-protein nitrogen is relatively important and consists almost entirely of amino-acids and polypeptides. Hexone bases and dicarboxylic amino-acids were found among the free amino-acids but acids containing sulphur were scarcely present. The structure of the cuticle resembles that of keratin. Identification of characteristic phosphagens in the muscle layer was difficult as they were only present in small quantities. Protein fasting *in vitro* resulted in a rapid fall of all nitrogen in the perivisceral fluid but prolonged fasting was attended by a breakdown of protein nitrogen and a slow increase in non-protein nitrogen. Analysis of substances excreted into the culture media indicate that in its normal

state *Ascaris* is ureotelic not ammoniotelic and the ureogenic cycle appears to be similar to that of the higher vertebrates. Diastases with an optimum pH of 6 constitute the proteolytic enzymes. Young *Ascaris* are capable of the degradation of nucleic acids to urea (except guanine) but this ability is considerably reduced in adults. The tissues have a fairly distinct amino-acid-oxidase activity towards most amino-acids, except aspartic and glutamic acids. Transamination reactions from alanine, aspartic acid, leucine and valine are fairly active but not from cystine, lysine and tryptophane; transaminase activity is almost entirely localized in the intestinal mucous membrane. Certain amino-acids are actively decarboxylated by *Ascaris* tissue especially the acid diamines which give rise to bases which are very active biologically, and Savel discusses their possible significance in the aetiology of unexpected symptoms of ascarid origin.

S.W.

289—Revue de Zoologie et de Botanique Africaines.

- a. FAIN, A., 1955.—“ Sur un nouveau gonyloneme, *G. congolense* n.sp., parasite de la poule, du canard et des gallinacés sauvages au Congo Belge et au Ruanda-Urundi.” 51 (1/2), 1-10.
- b. FAIN, A., 1955.—“ Deux nouveaux hôtes pour *Hepaticola hepatica* (Bancroft) au Ruanda-Urundi.” 51 (1/2), 11-12.
- c. SCIACCHITANO, I., 1955.—“ Su due gordii cavernicoli del Congo Belga.” 51 (1/2), 65-67.

(289a) *Gonylonema congolense* n.sp. is wide-spread in domestic fowls in eastern Belgian Congo and especially in Ituri and Ruanda-Urundi. It has also been found in the domesticated duck *Cairina moschata domestica* at Zega on the border of Lake Albert and in *Francolinus levaillanti* at Astrida, *Numida meleagris major* in Ituri and *N. meleagris intermedia* in Ruanda-Urundi. *G. congolense* is very similar to *G. sumani*. Numerous cuticular bosses extend the full length or most of the length of the cervical alae but unlike *G. sumani* the bosses commence near the mouth. There is a transversely elongate cuticular boss around the excretory pore. The gubernaculum is trough-like, composed of two pieces which join at an angle. The cervical papillae are considerably anterior to the nerve ring. *G. congolense* also resembles *G. ingluvicola* but differs in the arrangement and smaller number of cuticular bosses. These extend only 450-475 μ from the anterior end in the male as compared with 575-680 μ in the male of *G. ingluvicola*, and 728-900 μ in the female as compared with 1,300-2,600 μ . The right spicule is short. The left spicule is very long but not nearly as long as the body. Fain tabulates comparatively the principal characters of *G. congolense*, *G. sumani* and *G. ingluvicola* and gives a key to those species parasitic in birds.

M.MCK.

(289b) To his earlier host list of *Hepaticola hepatica* in the Belgian Congo and Ruanda-Urundi [for abstract see Helm. Abs., 22, No. 299a] Fain now adds *Cricetomys dissimilis proparator* and *Aethomys walambae pedester* found infected in the Astrida region of Ruanda-Urundi. These are also new hosts for this parasite.

R.T.L.

(289c) Sciacchitano reports two male *Chordodes capensis* from the Belgian Congo. This is the first species of *Chordodes* known to be cavernicolous and the first time a cavernicolous gordiacean has been found in Africa.

M.MCK.

290—Riso. Milan.

- a. ORSENIGO, M., 1955.—“ Comportamento di varietà italiane alla malattia ‘white tip’.” 4 (5), 15-17. [English & French summaries p. 17.]

(290a) Orsenigo tested 14 Italian varieties of rice for their resistance to “White tip” disease assumed to be due to *Aphelenchoides oryzae* (= *A. besseyi*). Most proved highly susceptible but some resistance was shown by the varieties Rinaldo Bersani, Carnaroli and Pierrot.

M.T.F.

291—Rivista di Parassitologia.

- a. ROSSI-ESPAGNET, A. & SALERA, U., 1955.—“Infestazione da *Gongylonema pulchrum* nell'uomo.” 16 (4), 221-224. [English summary p. 224.]
- b. ROSSI-ESPAGNET, A. & CAPONE, M., 1955.—“Primi risultati del frazionamento elettroforetico di estratti proteici di organismi parassitari.” 16 (4), 225-229. [English summary p. 229.]
- c. LIPPARONI, E., 1955.—“Presenza del *Simulium damnosum* nella zona del medio Uebi Scebeli.” 16 (4), 231-236. [English summary p. 236.]
- d. AGOSTINUCCI, G., 1955.—“Contributo alla conoscenza della diffusione delle parassitosi intestinali nella città di Roma.” 16 (4), 271-272.

(291a) Rossi-Espagnet & Salera report the presence of two filariform parasites in a papule on the upper lip of a ten-year-old girl in Rome. One was identified as *Gongylonema pulchrum*. No microfilariae were found in the blood and no further parasites were removed in the following four years. M.MCK.

(291b) Rossi-Espagnet & Capone give the electrophoretic diagrams of the protein fractionation of extracts from *Parascaris equorum*, *Taenia saginata*, *Echinococcus* cysts and *Cysticercus bovis*. M.MCK.

(291c) *Simulium damnosum*, apparently the first simuliid recorded from Somalia (its presence has been reported to the African Conference on Onchocerciasis at Leopoldville), was found along the middle Webi Shebeli and is described. Although the flies were not numerous and the country appears to be free of onchocerciasis, vigilance is recommended. Future river schemes for providing water during the dry season might lead to an increase in the number of flies. M.MCK.

(291d) Agostinucci reports *Trichuris* in 5.33%, *Ascaris* in 1.23%, *Enterobius* in 0.66% and *Taenia saginata* in 1% of the faecal examinations he conducted on 300 persons in Rome. M.MCK.

292—Roczniki Nauk Rolniczych. Seria E. Weterynarii.

- a. TARCZYŃSKI, S., 1955.—“Inwazja *Oesophagostomum dentatum* Rudolphi, 1803 u świń w przebiegu rożycy lub pomoru świń.” 66 (4), 603-609. [English & Russian summaries pp. 608-609.]

(292a) More than 80% of the pigs in Poland are infected with *Oesophagostomum dentatum*. Autopsies of 311 pigs showed that *O. dentatum* tends to leave its host if the latter also suffers from a bacterial or viral pathological infection. Assuming that, for practical purposes, up to 50 worms in 20 cm. of the large intestine can be taken as negative, it was found that of clinically healthy pigs 37.14% were negative and 9.71% had heavy infections, while the corresponding value in pigs with hog cholera were 87.27% and 3.63%, and in those with swine erysipelas 91.22% and 0%. It was supposed that other intestinal worms reacted similarly, but this was not the case with *Ascaris lumbricoides*. G.I.P.

293—Science. Lancaster, Pa.

- a. KAGAN, I. G., 1955.—“Hemagglutination after immunization with schistosome antigens.” 122 (3165), 376-377.

(293a) Kagan adapted to the antigen-antibody system in schistosomes the technique used by Boyden [see *J. Exper. Med.*, 1951, 93, p. 107] for the adsorption of protein antigens on sheep erythrocytes treated with tannic acid and their subsequent haemagglutination by specific antisera. Haemagglutination titres were obtained for the sera of six rabbits immunized twice weekly for three weeks with various doses of frozen cercariae of *Schistosoma mansoni* and for the serum of 16 hosts immunized by six intravenous injections administered twice weekly for three weeks with various stages of the life-cycle of *S. mansoni* and *Schistosomium douthitti*. Control sera were all negative by haemagglutination. Agglutinins were neither detected in rabbits immunized with living miracidia of *S. douthitti* and with immature female

worms of *Schistosoma mansoni*, nor in the serum of a rabbit immunized with an antigen prepared from a frog lung trematode (*Haematoloechus* sp.). The haemagglutination test for this series of sera was more sensitive than the CHR in detecting antibody and, with one exception, (spleen-egg antiserum) was less sensitive than the miracidium immobilization test. A comparison of agglutination and haemagglutination titres in chickens, cows, goats, horses, pigs and rabbits immunized with cercariae of *S. mansoni* revealed that, with the exception of chicken and pig, haemagglutination titres were much more sensitive. Inactivated normal horse, cow, goat and pig serum which had been shown to agglutinate living schistosome cercariae were thawed and frozen many times over a period of one year. Agglutinins were observed only in the horse at a titre of 1:8 but in similarly treated immune sera agglutination occurred at the same or a higher titre in each serum. Kagan suggests that the agglutination of cercariae in normal serum is probably caused by a non-specific agglutinin since all normal sera were negative by haemagglutination. Variation in haemagglutination titres occurred and was thought to be due to the variation in the solubility of the cercarial antigen used to coat the cells; a soluble cercarial fraction superior to the present antigen is being sought. D.L.H.R.

294—Semaine des Hôpitaux de Paris.

- a. POLONOVSKI, C., 1955.—“Effets de quelques traitements de l'oxyurose.” 31 (21), 1229.

(294a) Polonovski briefly reviews the various drugs recommended for the treatment of enterobiasis and concludes that, for children, gentian violet or piperazine salts, particularly piperazine diphenylacetate, are the most satisfactory. S.W.

295—Shikoku Acta Medica.

- a. ARAKAWA, Y. ET AL., 1955.—[On the filariasis in Misaki Peninsula, Ehime Prefecture.] 6 (1), 20–24. [In Japanese: English summary p. 20.]

(295a) In the Misaki district of the Ehime Prefecture of Japan, 1.45% of 760 persons showed infection with microfilariae of *Wuchereria bancrofti*. Of the 246 individuals with chronic clinical signs 14 had scrotal hydroxy and chyluria. No larvae were found in 84 mosquitoes belonging to three species. R.T.L.

296—Sovetskaya Meditsina.

- a. VASILKOVA, Z. G., 1955.—[The role of a medical district in control of helminth infections.] 19 (3), 21–27. [In Russian.]
 b. ZHUPANENKO, I. F., 1955.—[Oxygen therapy in ascariasis and dysentery.] 19 (3), 68–70. [In Russian.]
 c. NAZIROV, M. R., GLASHKINA, T. P. & TUAJEV, S. M., 1955.—[Acridine and oxygen therapy of helminth infections.] 19 (3), 70–71. [In Russian.]
 d. SIROTKINA, G. I., 1955.—[Acridine therapy of tapeworm infections.] 19 (3), 72–73. [In Russian.]
 e. LELL, R. K., 1955.—[The role of helminths and intestinal protozoa in chronic gastro-intestinal diseases.] 19 (5), 67–70. [In Russian.]

(296b) Ascaris infections occurring simultaneously with serious bacterial dysentery in 35 patients were treated by oxygen, in a dose of 1,500 to 2,000 ml., given by stomach tube during 10 to 12 minutes. Introduction more quickly caused substernal pain. The dose was repeated after 24 hours. There were no complaints. The worms were evacuated after two to five days and the efficacy obtained was 80%. Oxygen therapy should be applied preferably when the serious disease symptoms are subsiding and should not be prescribed in cases of pericolicitis. G.I.P.

(296c) Acridine in a dose of 8–10 gm. was given to 20 people after a complete evacuation of the gut and was followed by a laxative. Of 19 persons with *Taenia*, 17 passed a total of 36 worms, 21 with scolices. No worms were passed in one case with *Hymenolepis nana*. Acridine

immobilized but did not kill the worms. Oxygen in doses prescribed for ascariasis, caused the worms to be evacuated in all of four persons with *Enterobius* and in one out of three infected with *Ancylostoma*. G.I.P.

(296d) After two days on a semi-liquid diet, 150 patients with *Taenia*, *Diphyllobothrium* and *Hymenolepis* infections each received 30 gm. of magnesium sulphate; on the following morning 10 gm. of acridine were given during 15 minutes followed by 30 gm. of magnesium sulphate. 56% of the cases passed worms with scolices, 34% without. Acridine used as described above is effective against cestodes, is only slightly toxic and is a quicker method than male fern extract. G.I.P.

(296e) Helminth infections were present in 12.4% of 506 apparently healthy people, 17.3% of 422 with intestinal troubles and 21.7% of 193 with chronic dysentery. Although only 59 out of 216 patients who were treated for dysentery only were cured, all the 193 were cured in 14 to 31 days by a complex treatment which included worming. G.I.P.

297—Svensk Frötidning.

- a. BINGEFORS, S. & HAHLIN, M., 1955.—“Bekämpning av nematoder i klöverfrö genom behandling med metylbromid.” 24 (5), 59-64.

(297a) Treatment with methyl bromide to control stem nematodes in red clover seed has been tested. The experiments indicate that this is a fairly reliable means of controlling the spread of the nematode by seed. However, if the seed has too high a moisture content there is a danger of reducing germination. Reduction occurred when the seed had a moisture content of 12% or more but more experiments on a larger scale are considered necessary. S.B.

298—Tea Quarterly. Tea Research Institute of Ceylon.

- a. LOOS, C. A., 1955.—“Eelworms.” 26 (1/2), 27-28.

(298a) Loos discusses the damage due to meadow nematodes (*Pratylenchus* sp.) on tea in Ceylon and outlines control measures. Heavy applications of organic matter increase yields in eelworm infested soil. Fallowing of infested land should starve out the parasites but reintroduction must be guarded against and a two-year fallow is desirable before replanting. The most promising means of control is by the use of eelworm-tolerant clones and tests of suitable material are in progress but this is a long term project and much remains to be done. M.T.F.

299—Tidsskrift for Planteavl.

- a. RASMUSSEN, F., 1955.—“Forsøg med stammer af tidlig og halvsildig rødkløver, 1945-1950.” 59 (1), 17-35.
 b. ANON., 1955.—“Forsøg med varmtvandsbehandling af jordbaerplanter med henblik på bekaempelse af jordbaerål.” 59 (1), 155-158.
 c. ANON., 1955.—“Stammeforsøg med hvidkløver 1950-1954.” 59 (2), 357-360.

(299a) In field trials with early and medium late red clovers the early variety “Tidlig resistent Øtofte III” shows some resistance to stem eelworm, and two local varieties “Lofa” and “Hjelm” have shown good resistance to this pest. No pronounced differences in resistance were shown by the medium late red clover varieties tested. S.B.

(299b) [This paper is reprinted from *Medd. Forsøgsv. Planteak. Kbh.*, 1954, No. 517, 4 pp. For abstract see *Helm. Abs.*, 23, No. 283a.]

(299c) Different white clover varieties have been tested for yield. The following have shown resistance to stem nematode: Pajbjerg Milka II K, Lodi Øtofte II K and Pajbjerg Zero II K. S.B.

300—Tijdschrift voor Diergeneeskunde.

- a. SWIERSTRA, D., 1955.—“Beschouwingen over de epidemiologie van *Taenia saginata*.” 80 (14), 647–655. [English, French & German summaries p. 654.]

(300a) Swierstra's studies on the epidemiology of *Taenia saginata* in the Netherlands lead him to the conclusion that the pollution of water-ways with sewage or the use of sewage as a fertilizer do not play an important role in the infection of cattle with *Cysticercus bovis*. Direct infection of cattle as a result of human defaecation on pasture land is also thought to be rare and of little consequence. Swierstra is of the opinion that a very important factor in the spread of infection is the active emergence of proglottides from the anus independent of defaecation which leads to scattering of eggs from the clothing of carriers: he points out that these eggs remain infective much longer than those deposited in faeces. A heavily infected calf is usually a sign that there is a *T. saginata* carrier among the farm workers. The Dutch meat inspection laws, even if strictly carried out, will not reveal every infected carcass and Swierstra considers that measures such as deep freezing of all meat for 24 hours at temperatures of between -3°C . and -4°C . are necessary to prevent human infection. A.E.F.

301—Transactions of the American Microscopical Society.

- a. CAMPBELL, W. C. & TODD, A. C., 1955.—“Behavior of the miracidium of *Fascioloides magna* (Bassi, 1875) Ward, 1917 in the presence of a snail host.” 74 (4), 342–347.
 b. SCHELL, S. C., 1955.—“*Schistotaenia colymba* n.sp. from the horned grebe (*Colymbus auritus* L.)” 74 (4), 347–350.
 c. SELF, J. T. & TIMMONS, H. F., 1955.—“The parasites of the river carpsucker (*Carpiodes carpio* Raf.) in Lake Texoma.” 74 (4), 350–352.
 d. COIL, W. H., 1955.—“The morphology of *Cyclastera capito* (Rudolphi, 1819) Fuhrmann, 1901.” 74 (4), 353–357.
 e. HARGIS, Jr., W. J., 1955.—“Monogenetic trematodes of Gulf of Mexico fishes. Part VI. The superfamilies Polystomatoidea Price, 1936 and Diclidophoroidea Price, 1936.” 74 (4), 361–377.
 f. HARGIS, Jr., W. J., 1955.—“Monogenetic trematodes of Gulf of Mexico fishes. Part IX. The family Diclidophoridae Fuhrmann, 1928.” 74 (4), 377–388.

(301a) Campbell & Todd working with miracidia of *Fascioloides magna* and young *Stagnicola reflexa* and *Fossaria modicella rustica* found that under experimental conditions there was no evidence of the snails exerting any chemical attraction for the miracidia. Their results suggest that the miracidia are more infective when between 1.5 and 2 hours old than they are when under one hour or more than eight hours old. *Fossaria* was more readily attacked than was *Stagnicola*. Eggs kept for some weeks in a fully embryonated state appeared to produce miracidia with a greater ability to respond to the presence of a snail than did those which hatched as soon as the miracidium was fully developed. In only a very few cases did miracidia exhibit any excitement in the presence of a snail. S.W.

(301b) Schell describes and illustrates *Schistotaenia colymba* n.sp. from the intestine of *Colymbus auratus* in Idaho. The new species resembles *S. macrocirrus* most closely and is differentiated from this species and from *S. tenuicirrus* by the form of the scolex which is longer than it is wide, by the longer strobila (42–46 mm.), by the smaller hooks (108–110 μ from the tip of the base to the tip of the blade) and by having an equal number of testes in each half of the proglottis; in addition it differs from *S. tenuicirrus* in having suckers of a much smaller diameter and a much longer cirrus pouch. Schell also differentiates the new species from *S. scolopendria* and *S. macrorhyncha*, the other two known species of the genus. S.W.

(301c) In a survey of the helminths of *Carpiodes carpio* in Lake Texoma, Self & Timmons found 77% to be infected with *Neoechinorhynchus prolixus*. These caused no apparent injury to the fish except partial occlusion of the gut when 80 or more were present. The following are new records for this host: *Biacetabulum meridianum*, *Glaridacris confusus* and *Camallanus oxycephalus*. Large numbers of unidentified encysted proteocephalid larvae were found throughout the gut of all fish examined and large numbers of larval oxyuroid nematodes

occurred in the lower intestine of specimens collected in August, September and October. Only four immature digenetic trematodes were found lying free in the lumen of the gut and the authors assume that they are not normal parasites. The absence of digenetic trematode infections is correlated with the very low molluscan population. s.w.

(301d) Coil amplifies the descriptions of *Cyclastera capito* which have been given by Rudolphi, Krabbe and Fuhrmann, basing his observations on a large number of mature specimens collected from *Ajaia ajaia* in Mexico and some immature specimens collected by Ransom from the same host in the U.S.A. The shape of the hooks is very similar to that depicted by Krabbe but the size varies somewhat and, contrary to the observations of both Fuhrmann and Krabbe who give the number of hooks as 20 to 30, there are 14 hooks in each row. There is a single layer of closely set longitudinal muscles which are small in diameter, not two layers as reported by Fuhrmann. The genital apparatus is described in considerable detail and the paper is illustrated by 19 original drawings. s.w.

(301e) Continuing his work on the monogenetic trematodes of fish in the Gulf of Mexico, Hargis reviews the Hexabothriidae and the Diclidophoroidea and describes and illustrates six forms new to science. *Dasyonchocotyle spiniphallus* n.g., n.sp., from the gills of *Dasyatis sabina*, is most closely related to *Heteronchocotyle* but is distinguished by the elongate cylindrical body, by the shape and arrangement of the three pairs of hook-like sclerites which are unequal in size, by the testes lying posterior to the ovary, by the presence of spines on the cirrus and a flap on the prohaptor, and by the shape of the opisthaptor. *Heteronchocotyle leucas* n.sp., from the gills of *Caracharhinus leucas*, is similar to *H. hypoprioni* but is smaller, has smaller and differently shaped hook-like sclerites, smaller muscular funnels around the vaginal pores, appendix anchors which are different in size and shape, appendix suckers which are constricted ventrally and a different host. *Squalonchocotyle inpristi* n.sp., from the gills of *Pristis* sp., lacks appendix anchors and has a peculiarly shaped small body, only about seven testes, an unarmed cirrus, eggs without polar filaments and vitellaria closely applied to the gut and extending into the haptor. *Clupeocotyle brevoortia* n.g., n.sp., from the gills of *Brevoortia patronus*, differs from other mazocraeid genera in the possession of strongly pedunculated clamps, paired haptoral lappets bearing anchors, in the anterior mid-ventral position of the vaginal opening and in the clamps which have the dorsal and ventral loops reversed. *C. megacnifibula* n.sp., also from the gills of *B. patronus*, and *C. brevoortia* differ in general body shape, the size of the anterior clamps and the shape of the ovary. *Kuhnia brevoortia* n.sp., from the gills of *B. patronus*, is most closely related to *K. scombri* but is the only species of this genus found on clupeid fish, has antler-like spines on the curved elements of the genital corona and the sickle-shaped ends of the anchor are larger. *K. otolithis* is not considered to belong to this genus and is transferred to *Tagia* as *T. otolithis* n.comb. s.w.

(301f) Basing his theory on Sproston's idea of the homology of the clamp sclerites of the diclidophorid Monogenea, Hargis postulates that the ancestral clamp type of the Diclidophorinae and the Choricotylinae may be found in the Discocotylidae and, therefore, that the Diclidophoridae and Discocotylidae are more closely related than has hitherto been thought. *Choricotyle reynoldsi* is reduced to synonymy with *C. cynoscioni*. *C. aspinachorda* n.sp. is described and figured from the gills of *Orthoprists chrysopterus* and an isopod and *Diclidophora* sp. of Linton, 1905 is considered to be a probable synonym. This new species appears to resemble *C. hysteroncha* but differs from it in the posterior extent of the vitellaria, the number of coronal spines which are not bifid and in the possession of five to ten times as many testes. Two immature specimens of *C. louisianensis* n.sp. were collected from the gills of *Menticirrhus americanus* and are described and figured. The two most distinctive characters are the genital corona which bears multitudinous spines and the modifications of the centre piece in the clamps. *Pedocotyle minima* n.sp. from the gills of *Bairdiella chrysura* is similar to *P. morone*, the type species, but is smaller, has larger testes, a larger seminal receptacle which is apparently on the opposite side and differently shaped sclerites in the pedunculated and appendix clamps. s.w.

302—Transactions of the Royal Society of Tropical Medicine and Hygiene.

- a. STANDEN, O. D., 1955.—“The progress of degenerative changes in schistosomes following the treatment of experimental infections with 1:7-bis (*p*-dimethylaminophenoxy) heptane.” 49 (5), 416-423.
- b. BENNIE, I. & BLAIR, D. M., 1955.—“Urinary bilharziasis in European school children in Southern Rhodesia.” 49 (5), 424-434.
- c. SCHWETZ, J., 1955.—“On African schistosomiasis.” 49 (5), 435-436.
- d. JORDAN, P., 1955.—“Observations on *Wuchereria bancrofti* and *Acanthocheilonema perstans* in Tanganyika.” 49 (5), 460-471.
- e. NUGENT, D. A. W., SCOTT, D. & WADDY, B. B., 1955.—“Effect of water-point treatment with DDT on the incidence of guinea worm infection.” 49 (5), 476-477.
- f. EDESON, J. F. B., 1955.—“Clinical diagnosis of filariasis.” [Correspondence.] 49 (5), 488-489.
- g. GORDON, R. M., 1955.—“The host-parasite relationship in filariasis.” 49 (6), 496-507.
- h. MILNE, I. R. & DARLING, W. J. E., 1955.—“A case of haematemesis of bilharzial origin.” 49 (6), 574-576.
- i. SCHOFIELD, F. D., 1955.—“Two cases of loiasis with peripheral nerve involvement.” 49 (6), 588-589.
- j. KNIGHTS, H. T., 1955.—“Loiasis.” [Correspondence.] 49 (6), 602.
- k. MAINZER, F., 1955.—“A preliminary study of the effect of intensive doses of antimony on the heart.” [Correspondence.] 49 (6), 604.
- l. EDESON, J. F. B., WHARTON, R. H. & BUCKLEY, J. J. C., 1955.—“Filarial parasites resembling *Wuchereria malayi* in domestic and forest animals in Malaya.” [Correspondence.] 49 (6), 604-605.

(302a) Standen treated mice infected with *Schistosoma mansoni* and guinea-pigs infected with *S. japonicum* with 1:7-bis (*p*-dimethylaminophenoxy) heptane and observed the progress of degenerative changes in the schistosomes. The mice were given 100 mg. per kg. body-weight as a single oral dose, 70 days after infection, and the guinea-pigs 200 mg. per kg. for five days. In the mice the worms had all moved to the liver by the third day, the greatest shift taking place during the second to third day. Loss of pigment occurred, more obvious in the female than in the male. Haphazard separation of male and female worms was also observed. After the third day most of the live worms found in the liver were ensheathed in inflammatory tissue to a greater or lesser extent and all dead worms were fully ensheathed. From the third day onwards the proportion of dead worms present increased rapidly as the amount of inflammatory tissue increased. The degree of phagocytosis varied considerably, usually commencing over the middle portion of the worm and extending anteriorly and posteriorly; worms affected only in the middle portion showed considerable powers of movement in the anterior and sometimes the posterior portion. After removal from the mesenteric veins, female worms tended to be sluggish in their response to heat stimuli, brittle and generally distorted. In contrast to the males, little inflammatory reaction was observed around the affected female worms. In one instance, a group of *S. japonicum* was found ensheathed in the mesenteric veins and this opens up the possibility that should affected *S. haematobium* be immobilized for long enough in the venous anastomoses of the pelvis, then they may well be destroyed *in situ*. D.L.H.R.

(302b) Bennie & Blair carried out a schistosomiasis survey among children in Southern Rhodesia and found that 4.2% (425 out of 10,019) were infected with *Schistosoma haematobium*. In five instances a double infection was disclosed when eggs of *S. mansoni* were seen. The infection rate in boys (4.84%) as compared with girls (3.55%) showed a significant difference. In boys from the age of eleven years onwards there appears to be a progressive decline in infection rates but in girls the rate continues to rise steadily. The authors suggest that the apparent fall in infection rates in boys is due to increasing inability of the eggs to penetrate through a fibrosed bladder mucous membrane and also to the more intermittent passage of eggs which may be characteristic of the longer established infections. Examining infection rates from the point of view of length of residence, the highest rate was found in children born in the country but infection rates approaching the average were established in children who had resided in the colony for as little as two years. Possible factors explaining very high infection rates at some schools and low rates at others are discussed. D.L.H.R.

(302c) In a short paper Schwetz criticizes the part of the article by Amberson & Schwarz [for abstract see Helm. Abs., 22, No. 413a] which was on the taxonomy of the Planorbidae.
D.L.H.R.

(302d) Jordan reports on the results of surveys of filariasis in Tanganyika. Nearly 150 villages were visited and meteorological data and the incidence of microfilaraemia and of genital filariasis and elephantiasis noted. The three main foci of *Wuchereria bancrofti* corresponded to the areas where malaria is transmitted throughout the year. There appeared to be no direct relationship between rainfall and the incidence of *W. bancrofti* but the lower microfilaraemia and clinical rates corresponded with the lowest temperature and vapour pressure readings. *Acanthocheilonema perstans* was found to be more widely distributed than previously recorded, particularly in the Southern Province and this species also occurred in the area between Lakes Tanganyika and Victoria. There is some correlation between the distribution of *A. perstans* and of the banana growing areas but even where bananas are grown, if the rainfall is excessive, *A. perstans* does not occur. One out of 33 tsetse flies dissected contained a filarial worm in the abdomen and it is suggested that these flies may act as vectors for *A. perstans*.
S.W.

(302e) The treatment of ponds with sufficient wettable D.D.T. to give a concentration of up to 10 p.p.m. remarkably reduced the incidence of guinea-worm in five out of seven villages. The effect was only temporary and after a year the cyclops were re-established. When this control was supplemented by the provision of wells no further cases of the infection were found in three out of four villages; in the fourth the well was rarely used.
S.W.

(302f) Edeson has examined 91 children from an area where filariasis malayi is endemic and 122 from an area where it is unknown. Both groups were under five years old. From his observations he concludes that enlargement of the lymphatic glands is valueless in clinical diagnosis among young children.
S.W.

(302g) In his presidential address Gordon reviews the increasing and well founded belief that filariasis is far more injurious to human health than has hitherto been realized and is of the opinion that, although the control of these infections is a matter of great urgency, we have as yet insufficient knowledge to enable us to combat them successfully. He discusses host-parasite relationships with particular reference to *Loa loa* and indicates the limited extent of factual knowledge concerning them. Until more is known of host-parasite relationships there is little likelihood of arriving at a proper understanding of the symptomatology, diagnosis and treatment of filariasis.
S.W.

(302h) Milne & Darling describe a case of *Schistosoma haematobium* infection in a 4½-year-old European child. Symptoms included haematemesia and toxic symptoms affecting the liver, portal circulation and renal systems. There was no eosinophilia but both spleen and liver were much enlarged. Treatment with anthiomaline resulted in a clinical cure. Other members of the family were found to be infected with *S. haematobium*.
S.W.

(302i) Schofield describes two cases of loaiasis in which there was damage to solitary peripheral nerves. The lesions were thought to be caused by the death or encystment of the nematodes in close proximity to the nerves. The resulting oedematous allergic reactions damaged the nerves. In one case treatment with banocide resulted in complete recovery of nerve function.
S.W.

(302j) Knights describes his personal experience of infection with *Loa loa*. The Casoni test was strongly positive in his case and he is of the opinion that the possibility of a screening test for loaiasis and other forms of filariasis should be investigated.
S.W.

(302k) Referring to a paper by Zaki [for abstract see Helm. Abs., 24, No. 164bf] Mainzer points out that he and Krause published a paper in 1940 in which heart damage following antimony treatment was discussed [*Trans. R. Soc. trop. Med. Hyg.*, 33, 405-418].
S.W.

(302l) The authors have confirmed that microfilariae resembling those of *Wuchereria malayi* occur in *Macaca irus* in Malaya but they found the infection rate in the Kra monkeys to be considerably lower than that in man in the endemic area (three out of 55 monkeys compared with 41% of some 4,000 Malays examined). Sheathed microfilariae, apparently indistinguishable from *W. malayi*, were found in three out of 20 *Nycticebus coucang*, four out of five domestic dogs, 12 out of 31 domestic cats and in the only *Presbytis melalophos* examined. Adult worms of two species were recovered from the lymphatic systems of the Kra monkey, dog and cat; one species occurred in a dog and a cat and is clearly distinct from *W. malayi*; the second is closer to *W. malayi* of man and occurred in the Kra monkey and, possibly, a cat. Differences in developmental pattern were observed in experimental infections of *Mansonia longipalpis*, *M. uniformis* and *M. annulatus* and there were differences in the efficiency of these as vectors for the two species of *Wuchereria*. S.W.

303—Türk Veteriner Hekimleri Derneği Dergisi.

- a. AKMAN, Ş., HOLZ, J. & MİMİOĞLU, M., 1955.—“Petrolün köpek nematod ve cestod’ları üzerindeki tesiri.” 24 (100/101), 2001–2006. [German summary p. 2006.]
- b. GÜRALP, N., 1955.—“Koyunlarımızda görülen mide barsak nematodları hakkında.” 24 (100/101), 2009–2016. [English summary p. 2015.]
- c. GÜRALP, N., 1955.—“Türkiye ehli hayvanlarında pseudo-helminthiasis olayları.” 25 (102/103), 2108–2110. [English summary p. 2109.]
- d. GÜRALP, N., 1955.—“Koyunlarımızda bunostomose *Bunostomum trigonocephalum* Rudolphi, 1808’in morfolojisine dair araştırmalar.” 25 (102/103), 2111–2116. [English summary p. 2116.]
- e. GÜRALP, N., 1955.—“Hayvanlardan insanlara geçen paraziter hastalıklar.” 25 (104/105), 2248–2254. [English summary p. 2254.]
- f. GÜRALP, N., 1955.—“Koyunlarımızın akciğer parazitleri hakkında.” 25 (104/105), 2255–2259. [English summary p. 2258.]

(303a) The treatment with a petroleum emulsion of 37 dogs infected with ascarids and, in 13 cases, also by cestodes was fully efficient in 91% of the dogs. There were no toxic effects. G.I.P.

(303b) Güralp has found that trichostrongyles are very wide-spread in sheep in Turkey and cause serious losses. As the infective larvae are resistant even to winter conditions on the pastures the treatment of infected animals is the only prophylactic method possible. Phenothiazine was found to be the most efficient anthelmintic although it was not effective against *Oesophagostomum columbianum*, *Fasciola hepatica* or paramphistomes. S.W.

(303c) The English summary of this paper states: “Some *Pseudo-Helminthiasis* cases seen in domestic animals in Turkey mentioned”. S.W.

(303d) Güralp records that two out of ten sheep killed at an abattoir in Ankara were infected with *Bunostomum trigonocephalum*. He discusses the morphology of the nematodes and the treatment of the infection. S.W.

(303e) The English summary of this paper states: “Some Parasitic diseases transmitted from animals to man mentioned”. A number of protozoa, helminths and insects are briefly annotated. S.W.

(303f) Lungworm disease is wide-spread in sheep in Turkey. *Cystocaulus ocreatus*, *Dictyocaulus filaria*, *Protostrongylus rufescens*, *Muellerius capillaris* and *P. unciphorus* are mentioned. Control of the infective larvae and of the intermediate hosts is difficult and Güralp recommends that the treatment of infected animals combined with good feeding and management should be the first consideration. S.W.

304—Ugeskrift for Laeger.

- a. BØGESKOV-JENSEN, I., 1955.—“Iltbehandling af ascariasis.” 117 (15), 454-455.

(304a) Bøgeskov-Jensen has used the Talyzin oxygen treatment [for abstract see Helm. Abs., 23, No. 422a] against massive *Ascaris* infection in an 18-month-old girl. The dosage was 500 ml. oxygen administered four times at roughly four-day intervals. After the first dose 68 *Ascaris* were passed, 32 after the second, two after the third and nil after the fourth. The method is simple and completely harmless. After treatment the faeces were negative for ova. A.E.F.

305—Växtskyddsnotiser.

- a. FOLLIN, C., 1955.—“Skadegörare av internationell betydelse. Potatisål, *Heterodera rostochiensis*.” Year 1955, No. 2, pp. 27-32.

(305a) Follin gives data on the potato root eelworm, its distribution in different parts of the world, its biology and the control regulations in different countries. He also mentions experiments on controlling the pest by D-D mixture and on breeding resistant varieties. S.B.

306—Verhandlungen der Internationalen Vereinigung für Theoretische und Angewandte Limnologie.

- a. MANN, K. H., 1955.—“Some factors influencing the distribution of freshwater leeches in Britain.” 12, 582-587.

307—Veterinaria Italiana.

- a. PONZIANI, G., 1955.—“L'uccisione della larve di elminti nel terreno.” 6 (2), 168.
b. BATTELLI, C., 1955.—“L'oncocercosi nodulare dello zebù eritreo.” 6 (2), Suppl. pp. 274-277. [English, French & German summaries p. 277.]

(307a) To rid soil in animal enclosures of nematode larvae giving rise to bronchopulmonary and intestinal infection, sodium borate sprinkled over the ground is effective. Rates of application varying from 100-150 gm. per sq. m. to 300-400 gm. per 1-2 sq. m. have been suggested. Sodium chloride in a saturated solution of pasture salt, 1½ litres per sq. m. applied two or three times a year, is also successful. Both these methods suppress most of the vegetation but where it is desirable to preserve it, repeated applications of calcium cyanamide (8-12 quintals per hectare) or the sprinkling of milk of lime (10 hectolitres per hectare) or of a 1% solution of iron sulphate (6 hectolitres per hectare) can be effectively applied at the end of the winter. Repeated watering with fresh cattle urine or an aqueous solution of urea reduces the activity of many kinds of larvae. This is best carried out in warm weather. A mixture of sulphur and sand can be spread over the ground. This is followed by raking and light harrowing. If applied in limited quantities (100-150 gm. of sulphur per sq. m.) the vegetation is not excessively damaged. M.MCK.

(307b) Battelli describes the subcutaneous form of infection with *Onchocerca gibsoni* in zebu cattle in Eritrea. In this locality about 50% of the young zebu cattle and nearly all the adults have greyish-white nodules under the skin. These are not readily palpable but can be found after slaughtering. The nodules, which are not apparently pathogenic, contain adult males and females embedded in a web of tissue and yield quantities of larvae in a greyish liquid when cut. The average length of ten males was 46 mm. The larvae averaged 237 µ. The vector is unknown. M.MCK.

308—Veterinariya.

- a. DEMIDOV, N. V., 1955.—[Difluorotetrachlorethane and filixan in fascioliasis in sheep.] 32 (4), 29–32. [In Russian.]
- b. KHOLOSHCHANOV, V. A., 1955.—[Epizootiology of monieziasis and measures for controlling it.] 32 (4), 33–35. [In Russian.]
- c. DEUSOV, N. L., 1955.—[Paramphistomiasis in calves.] 32 (4), 36–37. [In Russian.]
- d. PASKALSKAYA, M. Y., 1955.—[A new disease of hens—plagiorchiasis.] 32 (4), 37–39. [In Russian.]
- e. KAGRAMANOV, A. K., 1955.—“Experimental treatment of sheep with fascioliasis by the method of subcutaneous application of carbon tetrachloride.” [Abstract.] 32 (4), 39–40. [In Russian.]
- f. ZAVGORODNI, Y. V., 1955.—[Subcutaneous application of carbon tetrachloride for fascioliasis in sheep.] [Abstract.] 32 (4), 40. [In Russian.]
- g. YAKOVLEV, Y., 1955.—[An advance experiment in veterinary science.] [Abstract.] 32 (4), 40. [In Russian.]

(308a) The efficacy and toxicity of difluorotetrachlorethane and filixan (a red powdery extract of male fern) were tested in 133 sheep infected with *Fasciola hepatica*. Difluorotetrachlorethane in doses of 20–30 ml. per animal, intubated into the rumen of 15 experimentally infected sheep 60–70 kg. in weight, was 100% efficient. It does not appear to act on immature worms. Transient respiratory disturbance was observed in one case. An aqueous suspension of filixan in a dose of 0.15–0.2 gm. per kg. body-weight given by bottle to eight experimentally infected sheep was 87.5% efficient and without toxic effects. G.I.P.

(308b) In the Rostov region the seasonal fluctuation in *Moniezia* infection of sheep was observed to be related to the appearance of oribatid mites on the soil surface. The periods of maximum infection were in April and December, when 15% and 17% of the sheep and 23.2% and 30.5% of the lambs respectively were infected. After the first year of treatment which was adjusted to the peak periods, infection in sheep had fallen from 17.1% to 7.1% and the infection was found on only 23% of 66 farms, compared with 88% in the previous year. G.I.P.

(308c) Paramphistomum infection of calves is wide-spread in wooded regions of the Ukraine. The clinical symptoms are produced by the immature worms; 50% of these were killed by phenothiazine given in the dose of 0.5 gm. per kg. body-weight three times at intervals of three to five days. No infection was observed on farms for two years following the prophylactic treatment of calves in spring and autumn with 0.3–0.5 gm. of hexachlorethane-fascioline per kg. body-weight. G.I.P.

(308d) *Plagiorchis arcuatus* causes seasonal outbreaks of disease in hens which, in the Ivanovo and Arzamas regions, last from May to June. Paskalskaya describes the clinical symptoms, pathology and diagnosis and the hitherto unknown life-cycle. The miracidia develop in the eggs and hatch after 15 to 17 days. The cercariae develop after 18 to 20 days in the experimentally infected *Bithynia tentaculata*; they then leave the mollusc and enter larvae of *Coenagrion hastulatum* or *Lestes sponsa*, where they encyst. Metacercariae from naturally infected dragon-flies when fed to hens developed into mature worms. G.I.P.

(308e) The treatment of fascioliasis in 1,728 sheep by the subcutaneous application of 2–3 ml. of carbon tetrachloride was 100% efficient. After effects lasting 30 minutes to 1½ hours, expressed in rapid movements and accelerated respiration and heart beat, were observed in some sheep and convulsions of the extremities occurred in a few. There were no deaths. G.I.P.

(308f) Subcutaneous application of 2 ml. of carbon tetrachloride to 2,312 sheep with fascioliasis gave a high efficiency. No side effects were observed. G.I.P.

(308g) In 123 sheep with fascioliasis the infection rate was lowered from 41% to 6% when 1–3 ml. of carbon tetrachloride were given subcutaneously. No harmful effects were observed except lameness in a few sheep which lasted from two to five minutes. G.I.P.

308—Veterinariya (cont.)

- h. MENDELEVICH, M. M., 1955.—[The use of oxygen for the treatment of some intestinal helminthiases in horses.] [Abstract.] 32 (4), 40-41. [In Russian.]
- i. BIVAKIN, P., 1955.—[Experimental use of phenothiazine for strongylosis of horses in winter conditions of Western Siberia.] [Abstract.] 32 (4), 41. [In Russian.]
- j. NANOBASHVILI, V. I., KAKHADZE, M. Y. & MGELADZE, L. M., 1955.—[On the possibility of using technical blue vitriol which contains arsenic for worming sheep.] [Abstract.] 32 (4), 41. [In Russian.]
- k. ZHUKOVSKAYA, S. A., 1955.—[Treatment of neoascariasis in calves with Glauber's salt.] [Abstract.] 32 (4), 41. [In Russian.]
- l. GADZHIEV, K. S., 1955.—[The action of certain anthelmintics on healthy calves up to one month old.] [Abstract.] 32 (4), 41-42. [In Russian.]
- m. VASIN, V. A., 1955.—[Poisoning of geese and ducks by pumpkin seeds.] [Abstract.] 32 (4), 42. [In Russian.]
- n. SELIVANOVA-YARTSEVA, A. S., 1955.—[Garlic as a new anthelmintic for cestode diseases of geese.] [Abstract.] 32 (4), 42. [In Russian.]

(308h) From experiments with oxygen *in vitro* and when given to five horses in various doses, the following conclusions are drawn: (i) oxygen therapy is not effective against strongylosis in horses; (ii) for parascariasis, oxygen in a single dose of 8-10 ml. had little effect, but repeated and larger doses (30-40 ml.) gave an extensefficacy of 40% and intens-efficacy of 89.9%. There were no toxic effects. Oxygen depresses the reproductive activity of the females of Strongylata and Parascaris and reduces the numbers of eggs produced. G.I.P.

(308i) Over 2,000 horses were treated for *Delafondia* disease during three consecutive winters (1951 to 1953); phenothiazine was used at a dose rate of 0.1 gm. per kg. body-weight. No ill effects were observed. During 1950, 80 horses died of the infection but in the winter following treatment no deaths occurred. G.I.P.

(308j) Ten lambs were treated with technical copper sulphate, containing traces of arsenic, to which 4 ml. of concentrated hydrochloric acid per litre of solution had been added. [No precise dosage is given, the "recommended" dose being used.] Four of the lambs received double the recommended dose and three were under clinical examination before, during and after the treatment. As there were no deviations from normal, the authors conclude that this solution can be used against *Moniezia* infection in sheep. G.I.P.

(308k) Zhukovskaya states that Glauber's salt gave good results in the treatment of 30 calves for *Neoscaris* infection. Mekhtiev completely cured 78 calves by using the salt in doses of 50-75 gm. for calves up to one month old, 75-125 gm. for those 1 to 1½ months old and 125-150 gm. for those 1½ to 2 months old. G.I.P.

(308l) Three anthelmintics (the doses are given in gm. per kg. body-weight) were tested on six healthy calves 15 to 30 days old, with these results: santonin in the dose of 0.02 gm. or 0.06 gm., and hexachlorethane at 0.2 gm. and 0.4 gm. produced no ill effects; 0.14 gm. of santonin and more than 0.4 gm. of hexachlorethane were toxic; 0.1 gm. of sodium fluoride killed the calf. G.I.P.

(308m) Symptoms of poisoning appeared two to three days after geese and ducks had eaten fresh pumpkin seeds freely. Death followed in seven to ten days. Autopsy revealed emphysema, degenerative changes in the heart, liver and kidneys and catarrhal inflammation of the digestive tract. When feeding with the seeds was discontinued the birds recovered in three to five days. G.I.P.

(308n) Garlic, in doses of 1 gm. to 3 gm. per kg. body-weight given after an 18-hour fast, cured eight out of ten geese infected with *Drepanidotaenia*. G.I.P.

308—Veterinariya (cont.)

- o. SELIVANOVA-YARTSEVA, A. S., 1955.—[Phenothiazine as a prophylactic for *Amidostomum* disease in geese.] [Abstract.] 32 (4), 42. [In Russian.]
- p. KARMATSKAYA, A. N., 1955.—[The influence of domestic ducks on the malaco-fauna of water reservoirs.] [Abstract.] 32 (4), 42-43. [In Russian.]
- q. VOLK, N. I., 1955.—[Hydatid in liver of pig.] [Demonstration.] 32 (4), 43. [In Russian.]
- r. ABROSIMOV, I. S., 1955.—[On the biology of the fowl cestode *Railletina cesticillus*.] [Abstract.] 32 (4), 43-44. [In Russian.]
- s. LAIKO, F. A., 1955.—[*Prosthogonimus* disease in fowls.] [Abstract.] 32 (4), 44. [In Russian.]
- t. POLISHCHUK, F. G. & CHUPRINOVA, A. S., 1955.—[Fascioliasis in nutria.] [Abstract.] 32 (4), 44. [In Russian.]
- u. GAGARIN, V. G. & SOLOVEV, G. V., 1955.—[The use of rubber hose and Agali tap in the treatment of dictyocauliasis in sheep.] [Abstract.] 32 (4), 44. [In Russian.]
- v. POKHVALENSKI, N. S., 1955.—[*Delafondia* disease in horses.] [Abstract.] 32 (4), 44-45. [In Russian.]
- w. VELICHKIN, P. A., 1955.—[The time taken for the development of *Delafondia*, *Alfortia* and *Strongylus* in foals with experimental infection.] [Abstract.] 32 (4), 45. [In Russian.]

(308o) Phenothiazine killed or stopped the development of eggs of *Amidostomum* when it was present in faeces in a proportion of 1:10 to 1:10,000. As a prophylactic it was most efficient in the group of geese which had received 50-350 mg. daily for two months starting from their first day on pasture. In this group only two eggs were found per microscope field, as against 74 in the controls. Geese should not receive more than 0.9 gm. of phenothiazine; 1.0 gm. to 1.5 gm. had a toxic effect and 2 gm. to 4 gm. retarded growth and development.

G.I.P.

(308p) When domestic ducks were released on to two water reservoirs, the numbers of molluscs which had been 50-60 and 100-150 per sq. m. respectively were reduced to single specimens by August to September. It is thought that this decrease in the mollusc fauna will assist in reducing *Fasciola*, *Opisthorchis* and other helminth infections. The increase in weight in ducks eating molluscs was 150-200 gm., compared with 50-75 gm. in the controls.

G.I.P.

(308r) 19 species of beetles are listed which the author has established as intermediate hosts for *Railletina cesticillus* by experimental infection with onchospheres. Chickens were infected with the cysticercoids which developed.

G.I.P.

(308s) Laiko reports an increased *Prosthogonimus* infection of fowls in 1951 in the Kovrov region which caused infected hens to cease laying eggs and resulted in a high degree of mortality. He gives the clinical symptoms of the disease. The fowls were treated with 2-5 ml. of carbon tetrachloride injected into the crop.

G.I.P.

(308t) The clinical symptoms of fascioliasis in nutria are described. The infection is often fatal. Treatment with hexachlorethane at 0.3 gm. per kg. body-weight gave good results.

G.I.P.

(308w) Four foals, 14-16 days old, known to be free of *Delafondia*, *Alfortia* and *Strongylus* were each experimentally infected with these species. After three months the foals were regularly examined for eggs and these were identified by larval culture. The prepatent periods were: for *Delafondia* from 6 months 28 days to 7 months 23 days, for *Alfortia* from 7 months 11 days to 9 months 14 days and for *Strongylus* from 8 months 19 days to 9 months 16 days. Foals should not, therefore, be treated for these infections until they are 9-10 months old.

G.I.P.

308—Veterinariya (cont.)

- x. MERKUSHEV, A. V., 1955.—[On the localization of *Trichinella* in the muscles.] 32 (4), 74-76. [In Russian.]
- y. KRASTIN, N. I. & PUTILINA, V. P., 1955.—[Anthelmintics in thelaziasis in cattle.] 32 (5), 32-36. [In Russian.]

(308x) In addition to the known localization of *Trichinella*, the author has found numerous cysts in the cutaneous muscles of various animals and suggests muscle biopsy as a means of diagnosis in some cases. Cysts were also found in the hypodermis and on hides. All the intestinal muscle layers in wolves, foxes, rabbits and white mice bore cysts, therefore the use of the gut of trichinous pigs for sausage making should be prohibited. The author's results agree with those data which suggest a similar localization of cysts in different animal species.

G.I.P.

(308y) To remove *Thelazia rhodesii* from the eyes of cattle 100 ml. of 0.5% aqueous lysol solution were used for each of three irrigations of the conjunctival sac at one-day intervals, followed by physiological saline solution. The number of infected adult cattle on a Khabarovsk farm was lowered from 81.6% to 20% and the intensity of infection became eight times less than in controls in which saline solution only had been used. In young animals complete removal of worms was achieved. Three consecutive irrigations of 65 cattle for slaughter, reduced the number infected from 89.7% to 8.8%. This rinse is non-pathogenic. Four irrigations are recommended. Lysol is better than the iodine now in use.

G.I.P.

309—Veterinary Medicine.

- a. FOSTER, A. O., 1955.—"The challenge of parasitism in farm animals." 50 (11), 546-548.
- b. PROCTOR, D. L., SINGER, R. H. & SUTTON, H. H., 1955.—"Clinical evaluation of piperazine adipate as an anthelmintic in horses." 50 (11), 575-578.

(309b) British reports on the use of piperazine adipate, based on a limited number of animals, led to large scale trials being carried out in the U.S.A. To test the safety of the drug, two foals weighting 350 lb. and 400 lb. respectively were dosed with 6 oz. and 10 oz., this being a greatly excessive amount for their size. Blood counts on 20 foals before and after receiving a mixture of piperazine adipate and phenothiazine were also made. The efficiency of the drug was tested by dosing 520 foals, yearlings and mature horses and then examining their faeces. The rates of dosage used were 1½ oz. of piperazine adipate to all foals less than 450 lb. and 3 oz. to all animals above this weight. Phenothiazine was administered with the piperazine adipate at the rate of 6gm. to 25 gm. per animal. The only observed blood change in the two foals receiving an excessive dose of the drug was a reduction in its chlorides. No clinical or pathological symptoms were observed. The 20 foals treated with piperazine adipate and phenothiazine showed only a chloride increase and no abnormal clinical reactions. The 520 foals, yearlings and mares treated with the two drugs showed no clinical reactions, the worms were expelled and there was a significant fall in the egg counts.

D.M.

310—Veterinary Record.

- a. JARRETT, W. F. H., McINTYRE, W. I. M., URQUHART, G. M. & BELL, E. J., 1955.—"Some factors in the epidemiology of parasitic bronchitis in cattle." 67 (44), 820-824.
- b. HEATH, G. B. S., 1955.—"Survey of sheep diseases." 67 (50), 980-983. [Discussion pp. 990-995.]
- c. HARBOUR, H. E., 1955.—"Recent advances in parasiticides." 67 (50), 1021-1024. [Discussion pp. 1024-1029.]
- d. TAYLOR, E. L., 1955.—"Adverse effects on animal health brought about by man's interference with nature." 67 (50), 1036-1042. [Discussion pp. 1042-1047.]

- c. SOULSBY, E. J. L., VENN, J. A. J. & GREEN, K. N., 1955.—“Hookworm disease in British cattle.” 67 (52), 1124–1125.
f. GIBSON, T. E., 1955.—“Controlled tests of tetrachlorethylene as an anthelmintic against *Trichostrongylus axei* in sheep.” 67 (52), 1129–1130.

(310a) Jarrett *et al.* have shown, by a number of experiments carried out during 1952, 1953 and 1954, that larvae of *Dictyocaulus viviparus* can survive and remain infective on pastures in the west of Scotland for as long as twelve months. The climatic conditions are discussed and a table is appended which summarizes the relevant meteorological data for the area. They have also shown by observations on young cattle and commercial herds that animals which have recovered from severe parasitic bronchitis and which give consistently negative results on faecal examination, may still harbour a few adult lungworms and act as silent carriers. Surveys made in two knackeries confirmed the existence of carriers, most of which were about one year old and harboured only small numbers (5–20) of lungworms; several had been housed during the winter. S.W.

(310b) Brief descriptions are given of the following methods of making surveys of sheep diseases: (i) statistics of mortality provided by farmers; (ii) detailed statistics from small numbers of farms, (iii) study of statistics available from Ministries of Food and Agriculture, (iv) records of materials received at laboratories, (v) collection of material from abattoirs and (vi) the collection of material from knackers. Examples are cited and some results obtained by these different survey methods are discussed. The helminth diseases mentioned are fascioliasis, coenuriasis and nematode diseases. Heath concludes that comprehensive disease surveys would be of value in planning research and although laborious need not necessarily be expensive. A general discussion followed. D.M.

(310c) Anthelmintics developed over the last three years are reviewed. Piperazine derivatives, particularly piperazine adipate, and the stable compound of piperazine and carbon bisulphide have been found to be efficacious. Very recently a powder containing 1.5% cadmium oxide, used at the rate of one lb. per 100 lb. of food, has been found effective against *Ascaris* in swine. In the practical application of anthelmintics an automatic drench gun has been developed which can be used with no risk of wool staining. In the discussion Griffiths described the development of continuous low level administration of phenothiazine to control nematode infections, both in mammals and birds. In birds, 4% phenothiazine incorporated into the mash effectively controls gapeworm but, unlike mammals, the growth rate of the birds is retarded. Some points in connection with the use of piperazine compounds in pigs and horses are mentioned. For pigs on a dry feeding system, sodium fluoride is safe, cheap and more economical in use but for pigs on a wet feeding system piperazine compounds are the drugs of choice. In equines piperazine adipate is active against ascarids, some small strongyles and *Trichonema* spp. When used against oxyurids at the rate of 10 gm. per 100 lb. body-weight a high percentage of the adult worms are removed but not immature forms. A second dose can be given after an appropriate time interval but reinfection is very difficult to prevent. D.M.

(310d) Changes in the environment of animals as they become domesticated by man are discussed. Cases are given where the great adaptability of farm animals and birds has been strained too far. The Canadian fox-farming industry was practically wiped out by lungworms and hookworm before the foxes' environment was suitably adjusted. The relationship between overcrowding of grazing stock and disease is very complex. Trichostrongylid nematodes, some of the oldest of parasites, have reached a stage of adjustment where the worms can live harmoniously with grazing animals in a common environment but by an unnatural concentration of stock the rate of intake of infective trichostrongyle larvae is greatly increased. The effect of the age of the grazing animal on the concentration of larvae on the herbage is important. Recent observations showed that groups of diseased lambs passed up to eight million eggs per day per lamb, but ewes only some 200,000 per day. A lamb grazing on an infected pasture will increase the number of larvae per pound of herbage but a ewe on the same pasture will decrease it, D.M.

(310e) An outbreak of *Bunostomum phlebotomum* among a group of 13 calves kept in an open yard is reported. Six calves died. Six of the survivors were grouped into pairs and treated respectively with phenothiazine (20 gm. per 100 lb. body-weight), tetrachlorethylene (10 ml. per 100 lb. body-weight), and 300 mg. of saccharated iron administered parenterally. Each treatment was repeated four times at intervals of 14 days. Both the anthelmintic and the iron therapy gave effective clinical cures. The low egg counts obtained before treatment were attributed to the long prepatent period of *B. phlebotomum* (30-56 days) during which the blood-sucking immature stages cannot be detected by egg counts. D.M.

(310f) The results of a trial to show the effect of tetrachlorethylene against *Trichostrongylus axei* were assessed by post-mortem worm counts one week after treatment. On this basis 5 c.c. of the drug, administered in a gelatin capsule, was shown to be completely ineffective against *T. axei*. By comparison 30 gm. of phenothiazine was shown to be extremely efficient. The drop in egg count shown after treatment with tetrachlorethylene is due to the inhibition of egg production by the drug. D.M.

311—Wiener Tierärztliche Monatsschrift.

- a. SUPPERER, R., 1955.—“Die Parasiten der Schweine—Diagnose, Pathogenität, volkswirtschaftliche Bedeutung, Bekämpfung.” 42 (4), 215-235. {English, French & Italian summaries p. 234-}

(311a) Supperer is concerned that more attention should be paid to parasites of the domestic pig which he is convinced are at present responsible for great economic losses in Austria. For the benefit of veterinary surgeons he describes the most important helminths to be found in pigs in Austria—*Strongyloides suis*, *Oesophagostomum*, *Ascaris*, *Hyostrongylus rubidus*, *Metastrongylus elongatus*, *Trichuris* and hydatid—with special emphasis on diagnosis, pathogenicity and control. The paper is illustrated with original line drawings of the ova of the species described. A.E.F.

312—Wisconsin Medical Journal.

- a. DANIELS, E. R. & PEDERSEN, E. K., 1955.—“A case of cardiopulmonary trichinosis with recovery.” 54 (5), 245-248.
b. PIPER, P. G. & BRINDLEY, B. I., 1955.—“Trichiniasis and the tonsil.” 54 (5), 248-249.

(312a) This report of a case of trichinelliasis with broncho-pneumonia and myocardial insufficiency is illustrated by two X-ray photographs showing dense bilateral infiltration of both lungs extending in a sunray pattern. R.T.L.

(312b) One of the rarest locations for *Trichinella* larvae in the body is the tonsillar crypt, for Wilkinson in 1929 found only six cases in a study of 10,000 pairs of tonsils and Starry in 1939 reported one instance in 8,516 tonsils. In the present case there were calcified trichinae associated with chronic inflammation in the skeletal muscle of the peritonsillar crypt of each tonsil. If specimens removed for the relief of muscular rheumatism were examined microscopically, many might be found to contain *Trichinella* infection. R.T.L.

313—Yokohama Medical Bulletin.

- a. KODAMA, T., HARADA, F., MUTO, N., MORIKUBO, S. & OKAMOTO, H., 1955.—“The studies about parasite control in rural areas in Japan. The new type of pit privy to separate urine and stool.” 6 (2), 72-76.

(313a) Since the second world war the incidence of *Ascaris* infection in Japan has increased to 50% to 90% in both rural and urban areas. Reinfection is rapid and control by mass treatment is difficult. Kodama *et al.* conclude that only by preventing the use of faeces as

fertilizer can control be achieved and they have designed a latrine cover which separates urine and stool and enables them to be collected in separate pits. The paper is illustrated by photographs and diagrams and details of the construction are given. The authors recommend the use of urine as fertilizer. S.W.

314—Zeitschrift für Hygiene und Infektionskrankheiten.

- a. GERMER, W. D., YONG, M. H., SCHULZE, W., JELTSCH, R. & ORRAHOOD, M. D., 1955.—“Die Klinik der Clonorchiasis.” 141 (2), 132-145.

(314a) Of the adult South Koreans living in the areas of the Kum and Naktong rivers 50% to 80% are infected with *Clonorchis sinensis*. As a result of detailed examinations of 132 cases three clinical groups were recognized: symptomless carriers, those with clonorchiasis without serious liver damage and those with liver cirrhosis. The results of the examinations and other observations are tabulated and some are related to the clinical groups. 121 of the cases consumed raw river fish. The degree of liver damage depended on the number of parasites present, the duration of the infection and the nature and severity of other liver injuries. Among the latter alcoholism played the greatest part. M.MCK.

315—Zeitschrift für Tropenmedizin und Parasitologie.

- a. GÖNNERT, R., 1955.—“Schistosomiasis-Studien. I. Beiträge zur Anatomie und Histologie von *Schistosoma mansoni*.” 6 (1), 18-33. [English summary p. 32.]
 b. GÖNNERT, R., 1955.—“Schistosomiasis-Studien. II. Über die Eibildung bei *Schistosoma mansoni* und das Schicksal der Eier im Wirtsorganismus.” 6 (1), 33-52. [English summary p. 50.]
 c. MUSTAFA, A. H., HANNA, M. & SHEHATA, A. H., 1955.—“Oral treatment of bilharziasis in children with miracid D.” 6 (1), 72-79. [German summary p. 79.]
 d. MINNING, W. & FUHRMANN, G., 1955.—“Protein-, Kohlehydrat- und Lipoid-Fractionen von *Fasciola hepatica* als KBR-Antigene.” 6 (1), 92-99. [English summary p. 99.]
 e. WINTER, H., 1955.—“Tropische Eosinophilie als symptomarme Filariasis.” 6 (1), 99-105. [English summary p. 105.]
 f. PEZENBURG, E. & OLECK, H. G., 1955.—“Über Missbildungen bei *Taenia saginata*.” 6 (1), 106-111. [English summary p. 110.]
 g. BEHRENS, W., 1955.—“Die Scheidenfärbung, ein einfaches diagnostisches Hilfsmittel zur Unterscheidung infektiöser Hakenwurmlarven von unbescheideten freilebenden Nematoden und ihren Larven.” 6 (1), 111-114. [English summary p. 114.]
 h. BOECKER, H., 1955.—“Ein weiterer Fund von dem Nematoden *Muspicea borreli* Sambon in Deutschland.” 6 (1), 115-116. [English summary pp. 115-116.]

(315a) Gönner has made a detailed anatomical and histological study of *Schistosoma mansoni*. Electron microscopy of the cuticula has revealed details of its finer structure and has confirmed the homogeneity of the spines and the nature of the basal membrane. The female gonads were examined with special reference to their function and significance. Among new findings were the fact that the vitellaria are haploid and the occurrence of oocytes in the posterior section of the vitelline duct in regenerating females, which confirms the phylogenetic relationship of ovary and vitelline glands. The ootype epithelium is composed of apocrine, serous glandular cells with a rhythmic function related to egg formation. The function of Mehlis' gland which gives off a mucous secretion seems to have nothing to do with ovulation. A.E.F.

(315b) Gönner deals with the origin of the egg material of *Schistosoma mansoni* and with egg formation with special reference to the egg-shell. The latter is formed in the ootype from the granula characterized as “shell drops” which are contained in the vitelline cells and become a homogeneous membrane under the influence of the ootype epithelium secretion: the finer structure of the egg-shell is described. The lateral spine has no function in connection with passage through tissue but assists in the passive transport of eggs against the blood stream in the capillaries. Embryonal development takes about six days. The maximum length of life of miracidia in the eggs (in tissue) is 2½ to 3 weeks: total life is therefore three

to four weeks. The subsequent fate of the egg (maceration and resorption of the miracidium, phagocytosis, and resorption of the shell) takes several months. These data are based on histological study of mouse livers examined at various intervals after infection and treatment with miracil-D. A.E.F.

(315c) Mustafa, Hanna & Shehata treated 50 children suffering from urinary schistosomiasis with miracil-D in a dosage of 16 mg. to 24 mg. per kg. body-weight daily for seven days. Twenty-five had been previously treated and six cases showed intestinal schistosomiasis in conjunction with the urinary infection. Three weeks after the course 48 were negative and remained so for six months; in the remaining two cases the egg count was markedly reduced. Mild and transitory side effects were noted, vomiting being the most common. Schistosome eggs disappeared from the stools in all cases of intestinal schistosomiasis. D.L.H.R.

(315d) Mianing & Fuhrmann have compared complement fixation antigen from protein, carbohydrate and lipid fractions of *Fasciola hepatica* with alcoholic extract of whole worm tested with sera from human and animal *Fasciola hepatica* and other trematode infections. Antigen from the protein fraction gave a weaker reaction than whole extract. Sera from man and apes infected with schistosomes were partly positive to the protein antigen but all schistosome sera were negative to whole antigen; *Clonorchis sinensis* sera were negative to both extracts. The extract from the carbohydrate fraction had no antigenic properties against *F. hepatica*, schistosome or *Clonorchis* infections. The lipid fraction reacted weakly against *Fasciola* but was negative to other trematode infections. It is therefore concluded that alcoholic whole extract from the body substance of *F. hepatica* is most suited for complement fixation. A.E.F.

(315e) Winter reports that three males who had lived for some time in south-east Asia developed leucocytosis, eosinophilia up to 70%, splenomegaly, swollen lymph glands and allergic respiratory symptoms. They all showed *Microfilaria malayi* in the lymph nodes. After specific treatment the blood picture returned to normal except for slight eosinophilia. The clinical symptoms were identical with those of tropical eosinophilia and Winter concludes that the latter is an allergic reaction, in susceptible patients, to filarial infection. A.E.F.

(315f) Pezenburg & Oleck describe an anomalous specimen of *Taenia saginata* recovered from a Berlin patient. It is described and compared with others described in the literature. A.E.F.

(315g) Behrenz has demonstrated that sheathed larvae of *Uncinaria stenocephala* absorb acridine orange dye while free-living nematodes and their larvae do not. The stain in no way affects the viability of larvae which can still be used for experimental infections. A.E.F.

(315h) Boecker reports *Muspicca borreli* from the diaphragm of a white mouse which was being used for *Trichinella* experiments. This is only the third record of this parasite in Germany. A.E.F.

316—Zentralblatt für Chirurgie.

- a. EMMER, O. & JÜLICH, A., 1955.—“Durch Segmentresektion entfernter Echinococcus cysticus der Lunge.” 80 (3), 97–104.

317—Zooles. Leopoldville.

- a. SCHWETZ, J., 1955.—“Sur quelques mollusques africains transmetteurs de bilharziose.” n.s. No. 31, pp. 64–67.

318—Zoologicheski Zhurnal.

- a. LUKIN, E. I., 1955.—[On the leech fauna of the Amur river basin.] 34 (2), 279–285. [In Russian.]
- b. AMOSOVA, I. S., 1955.—[On the occurrence of metacercariae of digenetic trematodes in certain polychaetes in the Barents Sea.] 34 (2), 286–290. [In Russian.]
- c. GUSEV, A. V., 1955.—[*Ancyrocephalus* (s.l.) *van benedenii* (Par. et Per.) (Monogenoidea) and its geographical distribution.] 34 (2), 291–294. [In Russian.]

(318a) The leech fauna of the Amur river basin is similar to that of eastern Siberia and consists of the following: *Piscicola geometra*, *Hemiclepsis marginata*, *Glossiphonia complanata*, *G. heteroclita*, *Helobdella stagnalis*, *Haemopsis sanguisuga*, *Herpobdella octoculata* and a species of *Herpobdella* externally similar to *H. testacea* but differing in the structure of the male sex organs. Plotnikov's material from eastern Siberia and the Far East, which was identified by him in 1907 as *H. lineata*, is identified by Lukin as *H. octoculata*. G.I.P.

(318b) Metacercariae from cysts in the body wall of *Nereis pelagica*, from the littoral region of the Barents Sea, when fed to young cod and pollack developed into *Lepidapedon gadi*. Similar cysts were also present in *Harmothoe imbricata* and *Lepidonotus squamata*. A second unidentified metacercaria found in the body wall of *Onuphis conchilega* differed in the shape of the gut and failed to infect fish. G.I.P.

(318c) Gusev gives a full description of *Ancyrocephalus van benedenii* (Perona & Perugia, 1890), with notes on its distribution, and a table of the variations in the size of its chitinous structures in the hosts *Mugil auratus*, *M. ramada* and *M. cephalus*. G.I.P.

NON-PERIODICAL LITERATURE

- 319—CHANDLER, A. C., 1955.—“Introduction to parasitology, with special reference to the parasites of man.” New York: John Wiley & Sons, Inc. (London: Chapman & Hall, Ltd.), 9th edit., xiv + 799 pp.

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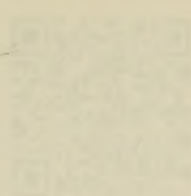
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